Intermec®

6820

80-Column Printer

6822

User Manual

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Document Change Record

This page records changes to this document. The document was originally released as Revision 001.

Version Number	Date	Description of Change
003	1/2012	Added support for the CN70 and CN70e mobile computers.
002	2/2009	Revised cover to indicate the manual is for the 6822 version of the 6820 series printer. Other minor changes including copyright date and process for downloading documentation from the Intermec website.

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Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Information

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

This section explains how to identify and understand dangers, warnings, cautions, and notes that are in this document. You may also see icons which tell you when to follow ESD procedures.

Warning

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Caution

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Follow ESD Procedures

This icon appears at the beginning of any procedure in this manual that could cause you to touch components (such as printed circuit boards) that are susceptible to damage from electrostatic discharge (ESD). When you see this icon, you must follow standard ESD guidelines to avoid damaging the equipment you are servicing.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Safety Precautions

Read and review all warnings and cautions in this manual before connecting the printer.

⚠️ **Warning**

Moving parts are exposed when the cover is open. Make sure the cover is closed before you operate the printer.

Do not put your fingers inside the print mechanism when the power is on.

Ensure that dangerous conditions cannot occur under any circumstances, even for a brief period of time.

Observe all safety and accident prevention regulations applicable to your specific region and application.

Carefully read the warning text on the envelope before using a cleaning card.

⚠️ **Caution**

Do not spray the printer with water. If you are using a hose to clean the premises in an industrial environment, remove the printer or protect it carefully from spray and moisture.

You must implement both hardware and software safety precautions to prevent the possibility of undefined system states.

Risk of explosion if battery is replaced by an incorrect type. Use of another battery may present a risk of fire or explosion.

The battery may present a fire or chemical burn hazard if mistreated. Do not disassemble the battery, heat above 100 °C (212 °F), or incinerate.

Dispose of any used batteries according to the instructions.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec website at **www.intermec.com** and click **Support** > **Returns and Repairs** > **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec website at **www.intermec.com** to download our current manuals (in PDF).

Visit the Intermec technical knowledge base (Knowledge Central) at **www.intermec.com** and click **Support** > **Knowledge Central** to review technical information or to request technical support for your Intermec product.

Send Feedback

Your feedback is crucial to the continual improvement of our documentation. To provide feedback about this manual, please contact the Intermec Technical Communications department directly at **TechnicalCommunications@intermec.com**.

Telephone Support

In the U.S.A. and Canada, call **1-800-755-5505**.

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec website, click **About Us** > **Contact Us**.

Service Location Support

For the most current listing of service locations, go to **www.intermec.com** and click **Support** >**Returns and Repairs** > **Repair Locations.**

For technical support in South Korea, use the after service locations listed below:

AWOO Systems
102-1304 SK Ventium
522 Dangjung-dong
Gunpo-si, Gyeonggi-do Korea, South 435-776
Contact: Mr. Sinbum Kang
Telephone: +82-31-436-1191
Email: **mjyun@awoo.co.kr**

IN Information System PTD LTD
6th Floor
Daegu Venture Center Bldg 95
Shinchun 3 Dong
Donggu, Daegu City, Korea
Email: **jmyou@idif.co.kr** or **korlim@gw.idif.co.kr**

Who Should Read This Manual

This user manual provides information about the features of the 6820 Series printers, and how to install, configure, operate, maintain, and troubleshoot them.

Related Documents

The Intermec website at **www.intermec.com** contains our documents (as .pdf files) that you can download for free.

To download documents

1 Visit the Intermec website at **www.intermec.com**.

2 Click the **Products** tab.

3 Using the **Products** menu, navigate to your product page. For example, to find the 6822 mobile printers product page, click **Products** > **Printers and Media** > **Mobile Printers** > **6822**.

4 Click the **Manuals** tab.

If your product does not have its own product page, click **Support** > **Manuals**. Use the **Product Category**, the **Product Family**, and **Product** to find your documentation.

Patent Information

This product is protected by one or more of the following United States patents:

5,581,293; 5,613,790; 5,927,876; 6,088,049; 6,345,920

There may be U.S. and Foreign Patents Pending.

1
Using the 6820 Printer

Use this chapter to familiarize yourself with the 6820 printer. In this chapter you will find these sections:

- **Learning About the Printer Models**
- **Guidelines for Operating the Printer**
- **Understanding the Control Panel**
- **Using the Reset Button**
- **Understanding the Power Supply Options**

Learning About the Printer Models

Use the 6820 printer to produce high-quality customer invoices, receipts, load reports, transfers, and other documents in the route accounting industry. A unique "sleep" feature saves energy when the printer is not printing, eliminating the need for an On/Off switch. Data input is normally provided by mobile computers.

The 6820 printer is available in the following models:

- **Fixed Mount Printer**
  The fixed mount printer is mounted in motor vehicles or used in a work location. The terminal holder may be mounted on the printer or a remote dock can connect to the side of the printer. A deep paper tray, which holds up to 200 3-ply forms (up to 5 cm or 2 in of paper) is located under the printer mechanism.

- **Portable Printer**
  The portable printer has a handle so that you can carry it. An optional internal battery permits operation without the use of an external power source. The terminal holder is an integral part of this printer. A shallow paper tray, which holds up to 50 3-ply forms (up to 2.5 cm or 1.0 in of paper) is located under the printer mechanism.

For illustrations of the printer models, see **"6820 Printer Models" on page 7.**

Follow ESD Procedures

The discharge of electrostatic energy accumulated on the human body, clothing, or other surfaces can damage or destroy the printhead or electronic components used in this printer. Avoid touching the electrical connectors while unpacking or setting up your printer.

Guidelines for Operating the Printer

- Make sure that your mobile computer remains connected to the printer when printing or operating.
- Keep the printer cover closed except during maintenance or when loading paper.
- Make sure the paper is properly installed in the paper tray or dashboard mount.
- Disconnect the printer power cable when jump-starting the vehicle.
- Make sure your printer is loaded with paper before communicating with your mobile computer.
- Do not spill liquids or food crumbs into the printer.
- Do not use solvents or abrasive cleaners on the printer.
- Do not rest objects on, under, or against the printer.
- If the printer is attached to a vehicle electrical system, do not start or stop the vehicle engine while you are printing.
- Do not overload the paper tray or paper jams will occur.

Understanding the Control Panel

The printer control panel has four status indicators in the top row and three buttons in the bottom row. Three status indicators blink when there is a problem with the printer.

Understanding the Status Indicators

Name	Indicator	Description
Paper Out	▱	The printer is out of paper.
Head Jam	⬇	The printhead is jammed and cannot move.
Low Battery	⬆	The internal battery voltage, the vehicle battery voltage, or the power module voltage is too low.

Understanding the Status Indicators (continued)

Name	Indicator	Description
Power		The power LED turns green when you press any button and goes off after ten seconds. The LED also goes on when:
		• the printer is attached to an external power supply.
		• a print job is sent to the printer.
		• you perform a power-on-self-test.

Understanding the Buttons

Name	Button	Function
Form Feed	FORM FEED	Press this button to feed the paper into the printer mechanism or when the printer should advance to the next form. If the printer runs out of paper, press this button to initiate automatic paper loading.
Set Page	SET PAGE	Press this button to signal the beginning of the page to the printer after you have made the appropriate paper adjustments, or to set the line feed counter to zero and move the printhead to its home position. Press this button to clear a Paper Out error so printing can resume.
Line Feed	LINE FEED	Press this button to adjust the top of the paper to the next line.

Note: All printer covers are hinged to the printer. These hinges have a tension screw (turn clockwise to tighten, turn counterclockwise to loosen), if you need to adjust them.

Using the Reset Button

Use the printer reset button to:

- force a synchronization between the printer and a connected PC when sending control codes.

- restart the printer for any reason.

Note: The reset button does not reset a connected Bluetooth module as it is powered from a different power source.

Both the fixed mount printer and the portable printer have a reset button on the left-hand side of the raised printer mechanism.
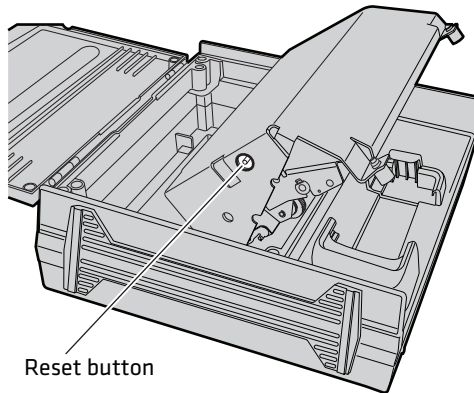
Reset button

Location of the Reset Button

Understanding the Power Supply Options

The following power supply options are available for the 6820.

Using the Internal Battery

The internal battery (P/N 317-075-xxx) allows the portable printer and some fixed mount printers to operate independently of other power sources.

⚠️ **Caution**

The 6820 discharges the internal battery even when the printer is not is use. Over time, the internal battery can discharge to the point where the battery is not recoverable.

Plug the printer into an external charge source or disconnect the battery when you store the printer for any length of time.

A total discharge of the battery is most likely to occur when the battery is new and the battery chemical reactions are not fully formed, or the battery has had only one charge cycle.

Connecting to a Vehicle Power Supply

You will need to order a printer installation kit to install the 6820 printer in a vehicle. The following kits are available:

* P/N 203-242-101 (fixed mount printers)
* P/N 203-242-102 (portable printers)

The installation kits contain all of the hardware (nuts, bolts, washers, a terminal ring, and a fuse link) for connecting the battery cable directly to the vehicle battery. These kits also contain adjustable wire clamps to secure the cable in place.

Note: The 6820 printer and associated electrical wiring should be installed under the supervision of properly trained and qualified personnel.

See the *6820 Printer Installation Instructions* to learn how to connect the printer to a vehicle power supply.

Connecting to a DC Power Source

Each printer has a DC power jack that connects the printer to a power source, such as the vehicle battery or an external power supply.

Each printer communicates with a mobile computer through the mobile computer socket (in a terminal holder, remote terminal holder, or vehicle dock).

Fixed Mount Printer

The DC power connector is on the bottom rear of the printer behind the printer terminal holder. The data communications socket is in either the printer terminal holder or a separate vehicle dock.

Portable Printer

The DC power connector is on the side of the printer beneath the printer terminal holder. The data communications socket is either in the printer terminal holder or a separate vehicle dock.
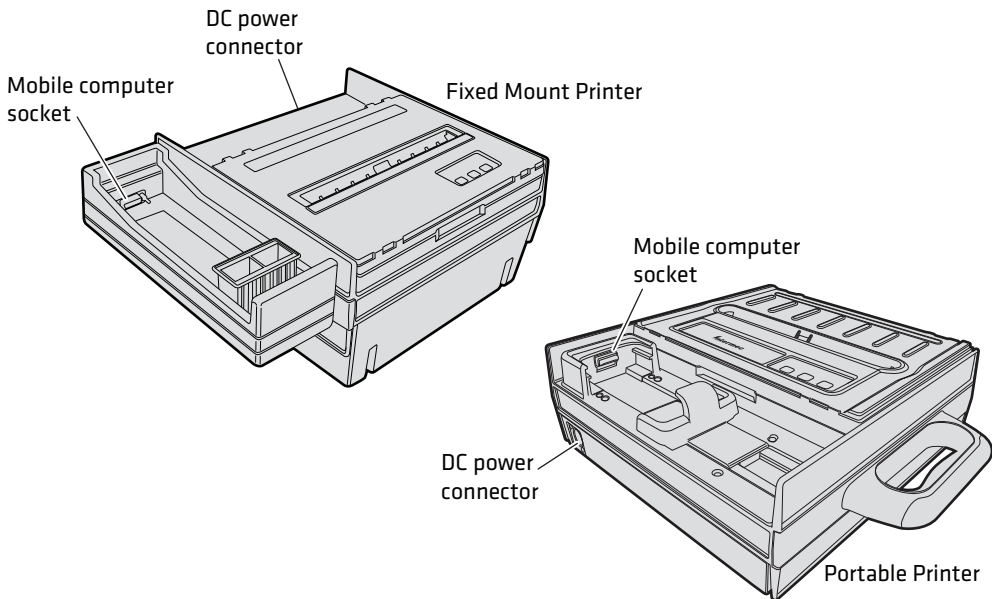
6820 Printer Models

2
Installing the 6820 Printer

This chapter provides instructions how to set up the 6820 printer for the first time. In this chapter you will find these sections:

- **Installing the Internal Battery**
- **Installing the Ribbon Cartridge**
- **Adjusting the Printhead Gap**
- **Loading the Paper Tray**
- **Loading Paper in the Printer**
- **Inserting a Computer in the Terminal Holder**

Installing the Internal Battery

The optional internal battery is primarily for portable printers. The battery can go in some fixed mount printers using a cable and a factory-installed adapter.

The printer battery recharges automatically when the printer is connected to an external power source. For most installations, the external power source is passed through the printer to the mobile computer. The printer battery does not provide charge to the computer.

Note: Remove the printer battery when storing a printer for more than 2 or 3 days. After storage, reinstall the battery and connect the printer to an external power source for at least 14 hours to recharge the battery.

To install the internal battery

1 Unlatch and open the printer mechanism.

Battery

Battery cable

Printer mechanism
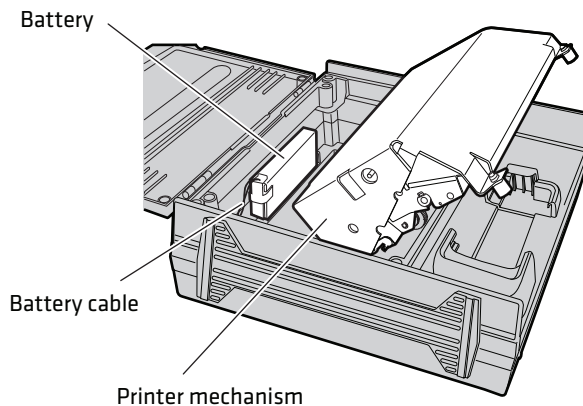
2 Lower the battery into the rear of the printer case.
Do not fully seat the battery at this time.

3 Attach the battery cable to the battery.

4 Push the battery down and back under the back edge of the case.
The battery should snap into place.

5 Close and latch the printer mechanism.

Installing the Ribbon Cartridge

Make sure there is a ribbon cartridge in the printer before you print and that the ribbon is fully seated (the cartridge makes a distinct "snap" or "click" when properly seated) with the visible portion of the ribbon straight and even.

To install the ribbon cartridge

1 Turn the ribbon advance knob (in the direction of the raised arrows) to remove any slack in the ribbon.

2 Squeeze the ribbon cartridge locking tab into the cartridge, then lower the cartridge over the printhead.

3 Lower the tab side of the cartridge until it clicks.

4 Release the tab and press down on the arrow to fully seat the ribbon cartridge (tab clicks outward).

5 Turn the ribbon advance knob (follow raised arrows) to align the ribbon in the front of the printhead.
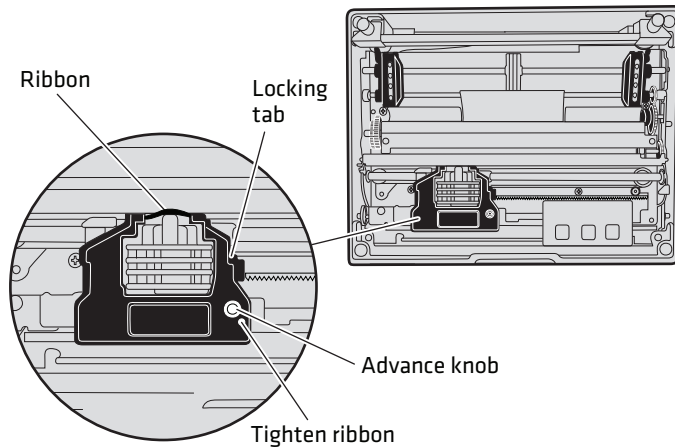
Installing the Ribbon Cartridge

Adjusting the Printhead Gap

The printhead gap adjuster is part of the printer mechanism on the side opposite the green thumbwheel. The printhead adjuster has five notches between the printhead and the platen roller, for different paper thicknesses.

To adjust the printhead gap

1 Verify the thickness of the paper loaded into the printer.

2 If you are using single-sheet forms, set the head gap adjuster to the third notch away from the paper.

3 If you are using multiple-sheet forms (2-ply or 3-ply), set the head gap adjuster to the fourth notch away from the paper.

4 If you experience frequent head jams, set the head gap adjuster to the fifth notch away from the paper. This may stop the head jams.

5 If the 2-ply and 3-ply paper have light printing, set the gap adjuster to a closer setting to darken the print.
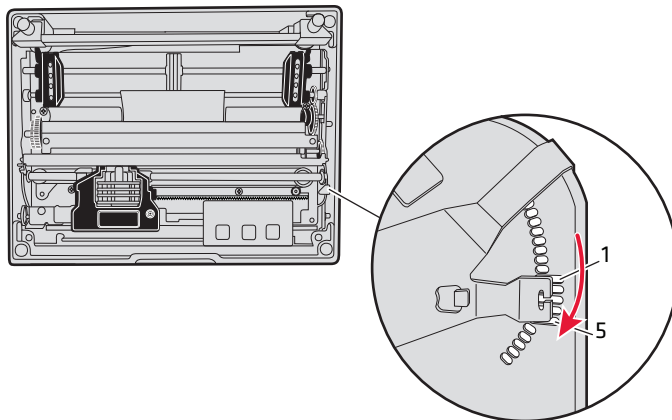
Adjusting the Printhead

Loading the Paper Tray

Note: Do not exceed the recommended paper quantity or thickness. When loading multiple-sheet paper, be sure to have the original facing up, with the leading edge towards the rear of the printer.

To load the paper tray in fixed mount and portable printers

1 Unlatch and raise the printer mechanism.

2 Lower a stack of paper, with the original faced up, into the paper tray under the printer mechanism.

- The fixed mount printer holds up to 200 3-ply forms about 5 cm (2 in) thick.

- The portable printer holds up to 50 3-ply forms about 2.5 cm (1 in) thick.

3 Pull the top form out and over the rear of the printer mechanism.

4 Lower the printer mechanism back into the operating position.

To load paper from the flat paper tray

1 Hold a stack of paper, up to 6 cm (2.5 in) thick, with the original facing you, and lay the stack flat into the tray.

2 Pull the top form out to load into the printer.

Loading Paper in the Printer

Paper for the 6820 has perforated strips that fit onto the pinfeed holder pins, guiding the paper into the printer. This paper is sold separately in 1, 2, or 3-ply forms.

To position the paper

1 Open the pinfeed holders outward.
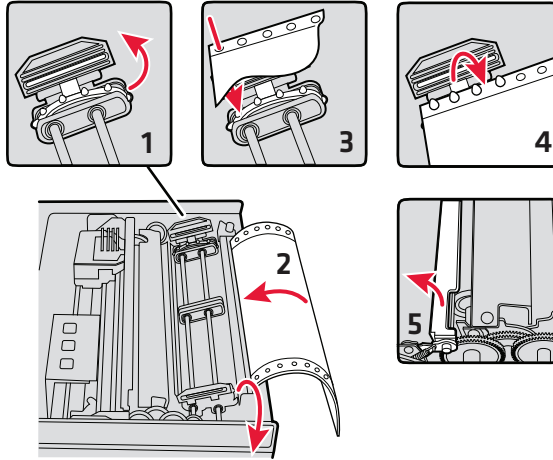
2 Take the top edge of the sheet of paper and position it, original side facing down, over the pinfeed holder pins.

3 Align the first few holes of the paper evenly on each side.

4 Close the pinfeed holders.

5 Raise the paper bail.

Adjusting the Pinfeed Holders

Note: There are two pinfeed holders, one next to the green thumbwheel and one opposite the green thumbwheel. Always loosen the pinfeed holder opposite the green thumbwheel.

Note: Adjusting the pinfeed holder next to the green thumbwheel may cause information to print in the wrong place. If this pinfeed holder is moved, correct its location by releasing the pinfeed holder tab, moving the pinfeed holder as close to the green thumbwheel as possible, then locking the pinfeed holder tab, before adjusting the opposite pinfeed holder.

To adjust the pinfeed holders

1 With the pinfeed holders open, release the locking tab on the pinfeed holder opposite the green thumbwheel.
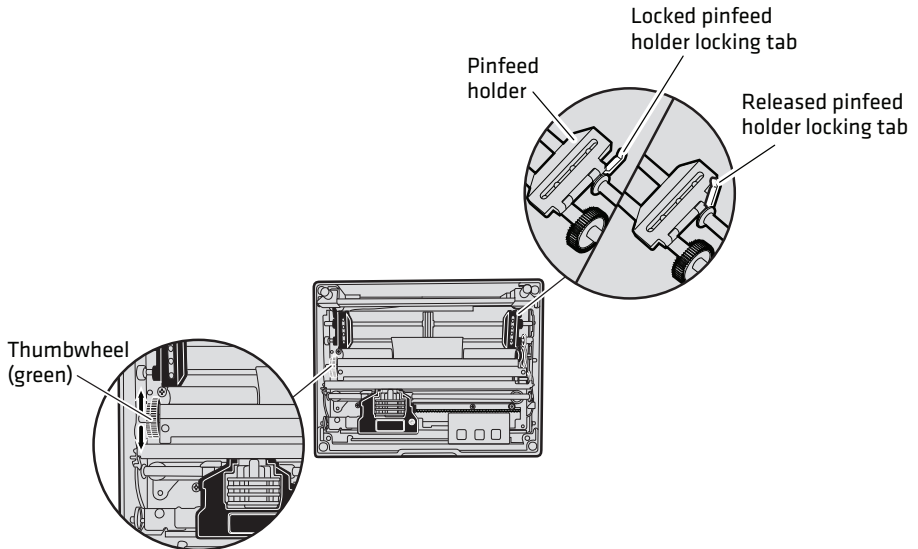
2 Move the pinfeed holder to align the pins with the paper.

3 Close the pinfeed holder.

4 Make sure that the paper is smooth (no folds, bulges, bows, etc.) between the pinfeed holders. If so, push the locking tab down on the pinfeed holder that you adjusted.

To feed paper into the printer

1 Press the **Form Feed** button to feed the paper into the printer.

2 Lower the paper bail. An empty printer auto feeds new paper approximately 0.25 cm (0.1 in) beyond the top of the paper bail.

Note: The ideal distance to feed paper beyond the paper bail may vary due to environmental conditions (such as humidity) and specific aspects of certain paper. Use the green thumbwheel to position the paper to a desired distance according to your conditions.

Note: If your paper has a preprinted logo on every page, make sure the printhead is below the preprinted logo. If not, you can adjust the position of the paper, either by pressing the **Line Feed** button, or by using the green thumbwheel.

3 Once the paper is properly positioned, press the **Set Page** button to clear the **Paper Out** light and indicate where the top of the page is located.

4 Close the printer lid. Make sure the paper passes through the paper slot when the printer begins to print.

Inserting a Computer in the Terminal Holder

Note: When removing the computer, do not press the computer keys against the terminal slide retainer. Always store the computer in the terminal holder.

The fixed mount or portable printers have terminal holder options for the 700 Series, CK61, CN3 Series, CN4 Series, CN70, and CN70e mobile computers.

To insert a mobile computer in the terminal holder

1 Insert the top of the computer into the terminal slide retainer.
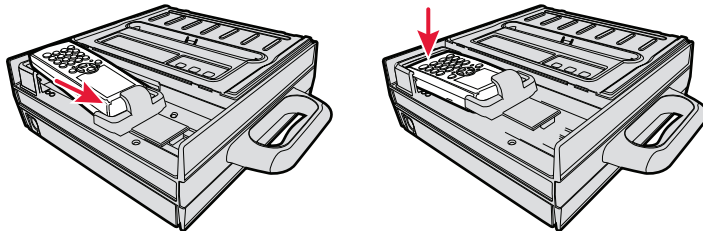
2 Use the computer to push the terminal slide all the way in the direction shown.

3 Lower the connector end of the computer into the terminal holder.

4 Slide the computer to fully seat it in the docking connector.

3
Configuring the 6820 Printer

Use the Printer Configuration Utility to load fonts on the printer and to change the printer settings. In this chapter you will find these sections:

- **Connecting to the Printer**
- **Understanding the Font Modules**
- **Using the Printer Configuration Utility**

Connecting to the Printer

Connect your printer to your desktop PC using a serial cable (P/N 226-270-xxx). The serial COM port connector on either the fixed mount printer or portable printer is on your printer mechanism, the same side as the green thumbwheel and next to the reset switch.

Before connecting to your PC, locate and disconnect the gray terminal holder ribbon cable connector from the floor of the printer cavity. The cable is located behind the printer mechanism on the same side as the green thumbwheel and is the one that is not attached to the printer mechanism.

Disconnect this terminal holder ribbon cable from the floor of the printer cavity

Ignore this cable attached to the printer mechanism
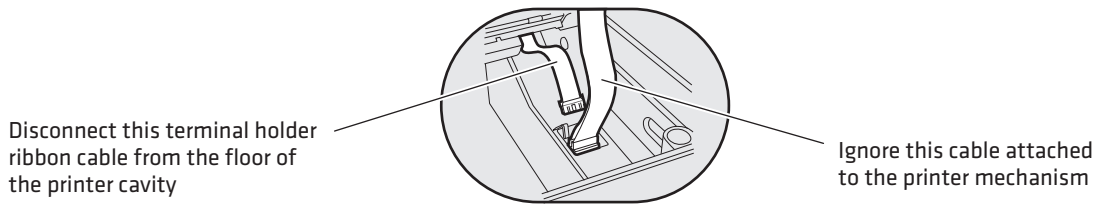
For more information on using your printer with your desktop PC, see **"Using the Printer Configuration Utility" on page 20**.

Understanding the Font Modules

Intermec provides the following font modules for your 6820:

- nft00000.mod — Default International
- nft00437.mod — IBM/Microsoft compatible Code Page 437
- nft00932.mod — JIS Japanese
- nft00936.mod — GB2312 Chinese Simplified
- nft00949.mod — KSC5601 Korean
- nft00950.mod — Big 5 Traditional Chinese

Note: There are three versions of the default font module (nft0000.mod): Arabic, Turkish, and International. Any one version of the default module, but not more than one, can appear in the 6820 Printer Configuration Utility FONTS directory and install on the printer. The International version of this font module is automatically placed in the FONTS directory when the Printer Configuration Utility is installed on the PC.

All three versions are included on the printer toolkit CD:

• The Arabic version is included in the Default Fonts\Arabic directory.

• The Turkish version is in the Default Fonts\Turkish directory.

• The International version is in the Default Fonts\International directory.

Use the Printer Configuration Utility to replace the existing default font module (nft00000.mod) with any of the of the other provided fonts. The Printer Configuration Utility is provided in the 6820 Tool Kit. Instructions for installing fonts are provided later in this chapter.

If you followed the default installation process, the Printer Configuration Utility FONTS directory is located at Program Files\Intermec\6820 Printer Configuration Utility\FONTS.

Do not rename the font files in the FONTS directory or they will not work correctly.

Caution

Using the Printer Configuration Utility

These instructions apply to desktop computers running the Microsoft® Windows 2000® or Windows XP® operating systems.

Installing the Printer Configuration Utility

The Printer Configuration Utility is provided on the 6820 Printer Toolkit CD (P/N 235-145-xxx).

To set up your PC to use the Printer Configuration Utility

1 Insert the toolkit CD in your PC.

2 Open the toolkit CD and double-click **setup.exe**. The Setup Wizard appears.

3 Click **Next**.
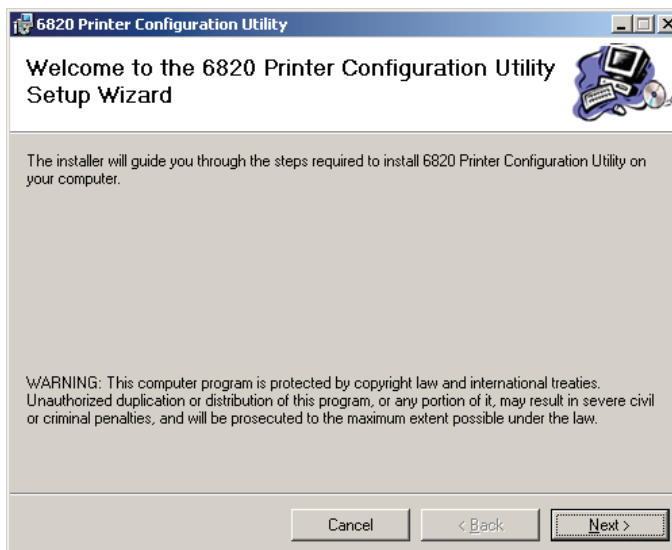
4 Click **Next** to copy the printer configuration utility files to your computer. To install the files in a different folder, type a path and folder name. You can also give everyone who uses the computer access to the printer configuration files, or limit access to yourself.
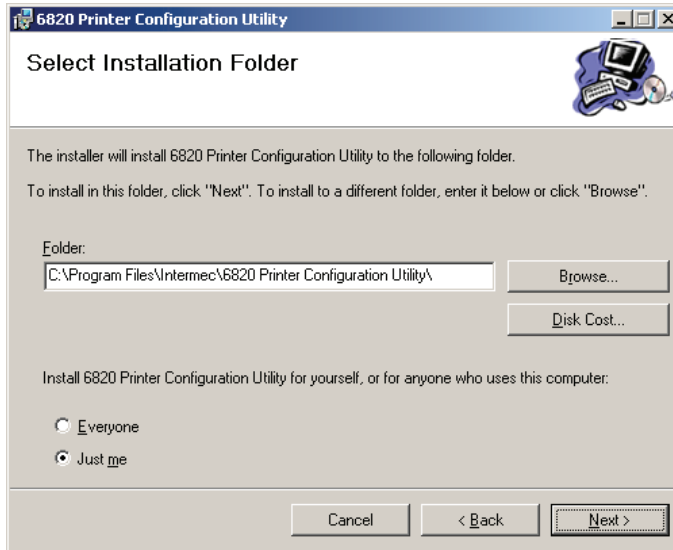
5 Click **Disk Cost** to see the amount of disk space required to install the Printer Configuration Utility. Click **OK** to close and return to the installation screens.
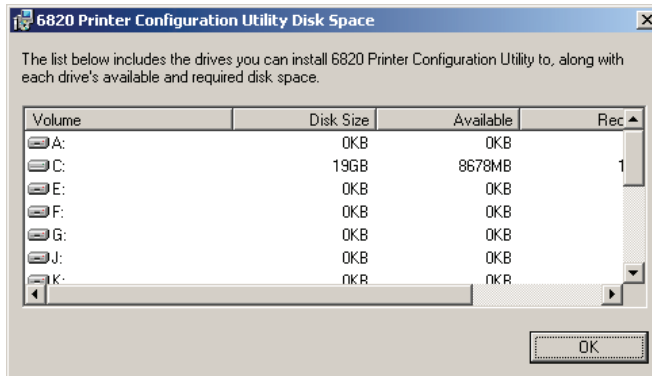
6 Click **Next** to verify installation, click **Back** to adjust the information on the previous screen, or click **Cancel** to exit the installation.
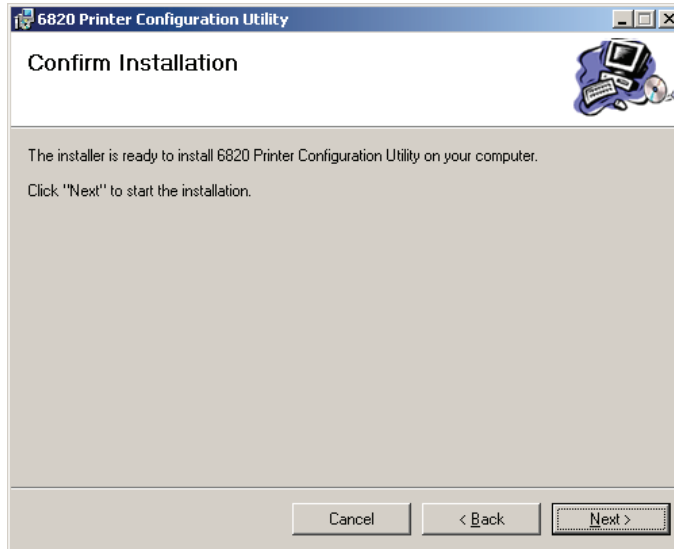
An Installation Complete message appears.

7 Click **Close** to exit the installation program.

Disabling the Microsoft ActiveSync Serial Port Connections

If you use Microsoft ActiveSync to connect to your computers, you must disable the serial port connections before using the Printer Configuration Utility.

To disable ActiveSync

1 In the ActiveSync application on your desktop, select **File** > **Connection Settings**.

2 Clear **Allow USB connections** and **Allow connections to one of the following:**.
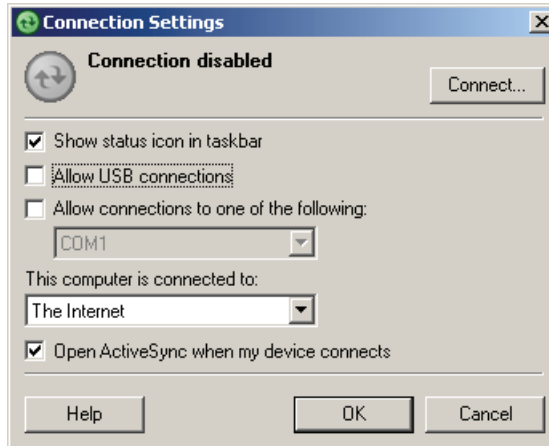
3 Click **OK**.

4 Close ActiveSync.

Operating the Printer Configuration Utility

The Printer Configuration Utility consists of a list of fonts, some parameter settings, and a printer control program.

When the Printer Configuration Utility is active, it holds a "configuration clipboard" in memory. Initially, this configuration has parameters set to their default values. Consider the contents of the configuration clipboard as temporary and lost when you exit from the utility.

- Click the **Get 6820 Configuration** button to view the current printer configuration.

- Click the **Set 6820 Configuration** button to change printer setting and send those settings to the printer.

- Click the **Reset to Defaults** button to reset the to the factory default printer configuration.

To start the Printer Configuration Utility

- Click the desktop icon or **Start** > **Programs** > **Intermec** > **6820 Printer Configuration Utility** > **PConfigApp.exe** to start the Printer Configuration Utility.
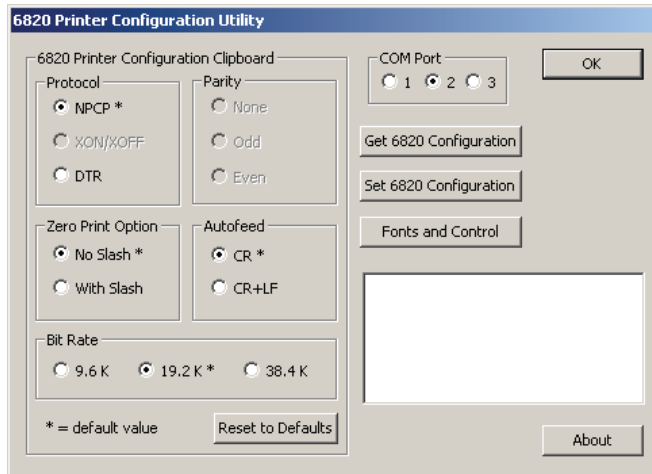
Communicating with the Printer

You can use COM port 1, 2, or 3 to communicate with your printer. COM port 1 is the default selection, but if it is not available or is being used by another application, select another COM port.

To communicate with the printer

1 Connect the serial interface cable (P/N 226-270-xxx) from your PC to the port on the printer mechanism, next to the **Reset** button.

Note: You must also disconnect the terminal holder gray ribbon cable where it connects to the transition board next to the pivot frame flex cables.

Disconnect this terminal holder ribbon cable from the floor of the printer cavity
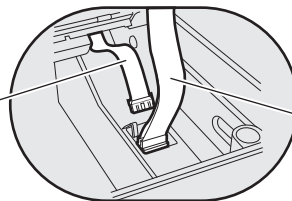
Ignore this cable attached to the printer mechanism

2 Click either the **Get 6820 Configuration** or the **Set 6820 Configuration** button to open communications with the printer.

The "Opening COM Port x to printer . . . " message appears in the text box when you initiate communications with the printer. The "x" in the message indicates which COM port is being used.

3 When the "Press Reset on the printer" message appears in the text box, press the **Reset** button on your printer. For the location of the **Reset** button on your printer, see **"Using the Reset Button" on page 5**.

The "Opening COM Port x to printer. . . Done." message indicates that communication between your PC and the printer is established.
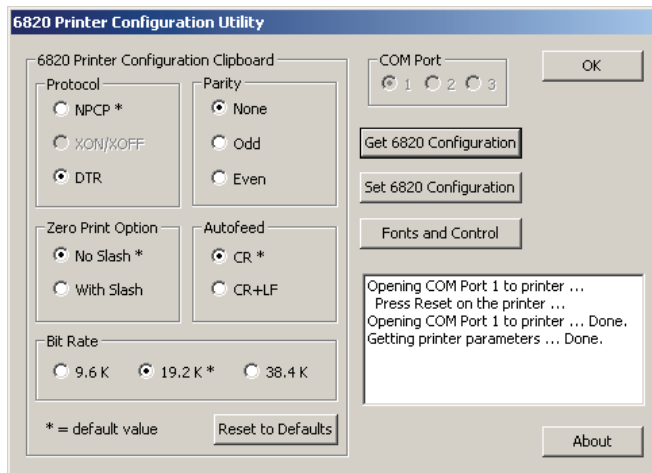
4 If "Unable to open COM Port x to printer" appears in the text box, another software application may be using the selected COM port. Select another COM port or disable the software application using the COM port. Also, verify that the gray terminal holder ribbon is disconnected as indicated earlier. For more error messages, see **"Error Messages" on page 31**.

6820 Printer Configuration Utility

6820 Printer Configuration Clipboard

Protocol
- ⦿ NPCP *
- ○ XON/XOFF
- ○ DTR

Parity
- ○ None
- ○ Odd
- ○ Even

Zero Print Option
- ⦿ No Slash *
- ○ With Slash

Autofeed
- ⦿ CR *
- ○ CR+LF

Bit Rate
- ○ 9.6 K   ⦿ 19.2 K *   ○ 38.4 K

COM Port
- ⦿ 1 ○ 2 ○ 3

[OK]

[Get 6820 Configuration]

[Set 6820 Configuration]

[Fonts and Control]

Opening COM Port 1 to printer ...
   Press Reset on the printer ...
Unable to open COM Port 1 to printer.
   Access to COM port 1 is denied.
   Close applications using COM port 1
      or try another port.

* = default value   [Reset to Defaults]   [About]

To view the settings on your 6820

1 Click the **Get 6820 Configuration** button to initiate communication.

The "Getting printer parameters . . . " message appears when the Printer Configuration Utility retrieves configuration information from the printer.

The message "Getting printer parameters . . . Done" appears after configuration information is retrieved.

2 Modify configuration settings or click **OK** to close the Printer Configuration Utility.

Setting the 6820 Configuration

Use the Printer Configuration Utility to set or modify the 6820 configuration setting, install or remove fonts, or load an updated printer control program.

To modify configuration settings

1 Make changes to the Configuration Clipboard or click the **Reset to Defaults** button to undo your selections and return them to their defaults.

Note: When using a Bluetooth adapter you must select the DTR communications protocol and a bit rate of 19.2 K.

2 Click the **Set 6820 Configuration** button to initiate communication with the printer. The "Setting printer parameters . . ." message appears when you initiate communication with the printer.

The "Setting printer parameters . . . Done" message appears when configuration parameters are set.

Note: The "Unable to set printer parameters" message indicates a dropped connection between your PC and your printer.

3 If the configuration is complete, click **OK** to close the utility and detach the serial cable.

To update 6820 fonts or the 6820 control program

- Click the **Fonts and Control** button to update the fonts stored in your printer or to update the printer control program. The **Fonts Available for Update** list shows font files that are available. The **Fonts Selected for Update** list show fonts that are to be installed on the printer.
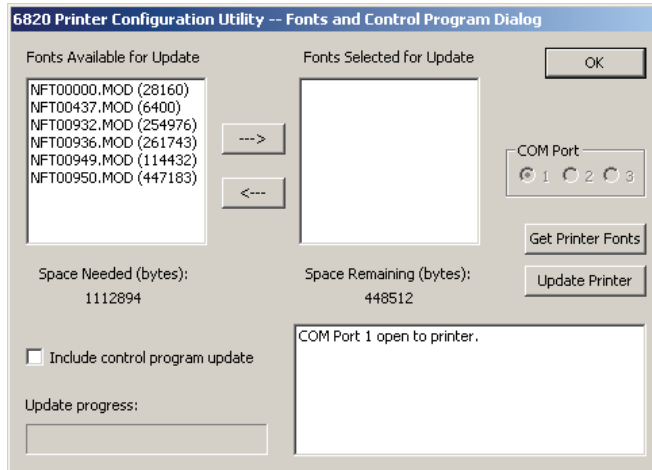
To learn what fonts are currently installed on your printer

- Click the **Get Printer Fonts** button. The installed fonts appear in the text box in the bottom right corner of the dialog box.
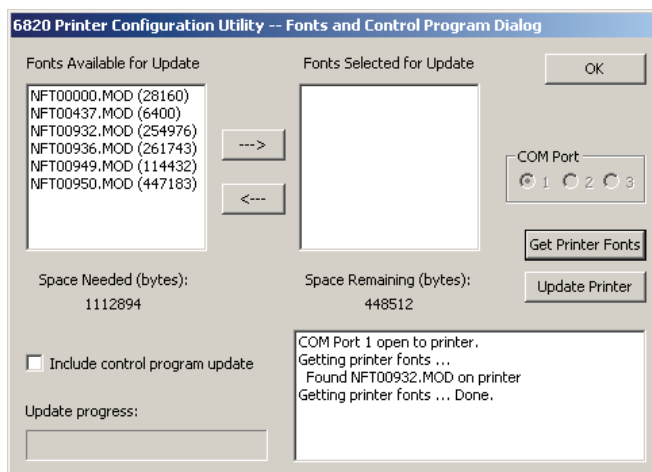
To select a font file

1 Highlight the font files you want to download in the **Fonts Available for Update** list.

2 Click the right arrow pointing to the **Fonts Selected for Update** list to copy the selected font files to this list. Below is a sample screen.
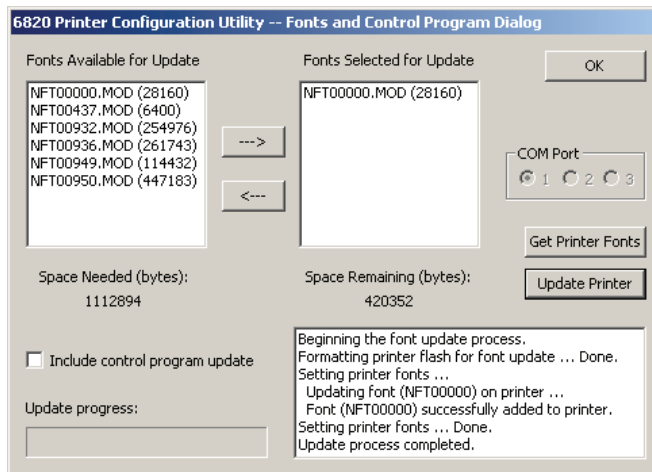
If the fonts you select exceed the space available in printer memory, an error message appears.

3 Click **OK** to close the error message and not copy the font to the **Fonts Selected for Update** list.

If there are two or more fonts that exceed the space allowed, this message repeats until an error message is displayed for each of the font files that went over the space allowed.

The **Space Needed** information shown beneath the **Fonts Available for Update** list indicates the total space required (in bytes) for all of the fonts in the list. The **Space Remaining** information listed below the **Fonts Selected for Update** list displays the space remaining in the printer, given the fonts in the **Selected** list.

4 Click **Update Printer** to update the printer fonts and the control program depending on the options selected on the dialog.

If the **Selected** list is empty and the Include control program update is not checked, a "Nothing selected for update" message appears in the text box.

Formats the printer flash for font updates and writes new font files to the printer for any fonts in the Selected list.

5 Move your fonts to and from the **Fonts Selected for Update** list.

- Click the right arrow to copy the selected font file from the **Fonts Available for Update** list to the **Fonts Selected for Update** list.

- Click the left arrow to remove the selected file from the **Fonts Selected for Update** list.

6 Click **Update Printer** to update the fonts in the printer with those in the **Fonts Selected for Update** list.

The **Update progress:** bar indicates the progress as the control program or fonts are written to the printer.

7 Check the **Include program control update** check box to include the printer control program when updating the printer.
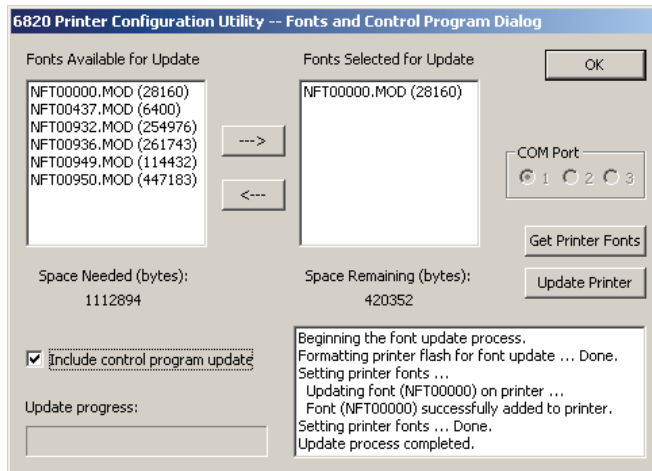
Note: You only need to update the control program when new versions of the control program are released.

Default Printer Settings

Settings	Value
Zero Print Option	Print zeros without a slash
Auto Feed Configuration	CR (carriage return at end of line without line feed)
Protocol	NPCP
Parity	N/A (for NPCP)
Bit Rate	19.2 K (19200)

For other printer defaults, see **"Factory-Installed Printer Defaults" on page 112**.

Error Messages

There are three instances when the 6820 may not connect to your PC. In the example error messages, *x* indicates the assigned COM port number.

Error Messages

Error Type	Message	Cause
Timeout Error	`Unable to open COM port x to printer. Printer not reset within the time allowed or printer not connected to COM port x.`	The timeout error may occur due to either of these situations: • The printer was not reset in the time allowed. • The COM port exists on the desktop computer but nothing is connected to the port. • The gray Bluetooth terminal holder ribbon cable is not disconnected from the bottom of the printer.
Port Not Found	`Unable to open COM port x to printer. COM port x cannot be found.`	The COM port does not exist. The particular COM port is identified in the error message.
Access Denied	`Unable to open COM port x to printer. Access to COM port x is denied. Close applications using COM port x or try another port.`	The COM port exists but a connection with the 6820 is not established. The particular COM port is identified in the error message.

Connecting to the Bluetooth Adapter

If your 6820 has a Bluetooth adapter, be sure to connect this adapter after you finish reconfiguring the 6820 fonts and exit the Printer Configuration Utility (flat gray ribbon cable under the printer mechanism).

Enable Microsoft ActiveSync Serial Port Connection

If you use Microsoft ActiveSync to connect to your terminals, then you need to enable serial port based connections.

To enable Microsoft ActiveSync serial port based connections

1 Start ActiveSync and select **File** > **Connection Settings**.

2 Check **Allow USB connections** and **Allow connections to one of the following:**.

3 Click **OK**.
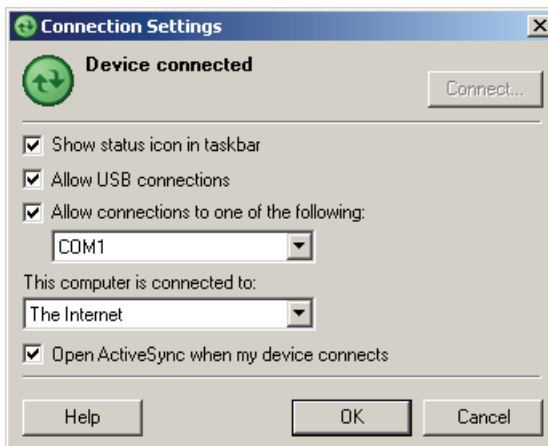
4 Close ActiveSync.

4
Control Code Definitions

This chapter contains a set of control code definitions and specifications for page layout for the 6820 printer. In this chapter you will find these sections:

- **Understanding Control Code Definitions**
- **Using Printer Control Codes**

Understanding Control Code Definitions

I/O Buffer

All characters and control codes received by the printer are stored in this buffer. Characters and controls codes are read from this buffer and acted upon to form the print buffer. Characters are removed from the I/O buffer as they are processed.

Print Image Buffer

All characters go through this buffer on their way to the printed page. This buffer contains the graphic image of the dots to print, from which characters are rendered. It is cleared when its contents are printed.

Special Notations

The following information defines notations included in the format definitions of the escape sequences, throughout this section.

Special Notations

Notation	Description
(0)	Used in the ASCII column of any of the Format definitions, indicates that its value can only be zero (and not the character "0"). For example: Select Top-Down Printing ESC US (0).
(1)	Used in the ASCII column of any of the Format definitions, indicates that its value can only be one (and not the character "1"). For example: Select Bottom-Up Printing ESC US (1).
*	When a number (at the end of an escape sequence) is marked with an asterisk, then either the value corresponding to that number or the value of the string character can be used for that number. For example, if 1* is shown, then either the value (1), or the value of the string character (decimal: 49, hex: 31) can be used.
NUL	The NUL character is represented in the **Dec** column as 0, in the **Hex** column as 00, and in the **ASCII** column as NUL.

Using Printer Control Codes

These control code definitions are organized by categories of functions. Use the following methods to easily locate control codes.

- Numeric order (single character codes only). Locate the index for the control code, and turn directly to that page. For more information, see **"Single Character Control Codes" on page 132**. Locate the index for the control code, and turn directly to that page.

- Numeric order (complete list). Look up control codes by their actual code values. For more information, see **"Escape Sequence Quick Reference" on page 133**.

Backspace

Empties the print buffer. Moves the printhead left one character space (using the current pitch). This can be performed to, but not beyond, the left margin setting. The backspace is ignored if justification of right, full, or centered is selected.

Format

Decimal	Hex	ASCII
8	08	BS

The backspace control code (BS) is not reliable when text contains different character pitches. For reliable backspacing, use the escape sequence (ESC "\"), Set Relative Print Position.

Beeper

The printer produces a beep lasting approximately 1/10 of a second.

Format

Decimal	Hex	ASCII
7	07	BEL

Cancel Line

Discards all of the characters currently in the print buffer. Sets the current print position to left margin. Text already printed cannot be canceled.

Format

Decimal	Hex	ASCII
24	18	CAN

Carriage Return

Repositions the printhead at the start of the print line (usually at the left margin), and repositions the pointer to the start of the print buffer, after printing all data in the buffer. Also, all of the "one line" functions are reset, such as bold, double-strike, double-wide, or unidirectional printing.

Format

Decimal	Hex	ASCII
13	0D	CR

Note: You can add an automatic line feed with a configuration item.

Delete

Deletes the last character in the print buffer. This functions only in left justification.

Format

Decimal	Hex	ASCII
127	7F	DEL

Form Feed

Prints the contents of the print buffer, clears the print buffer, and advances the paper to the top of the next page (Top of Form), according to the current page length setting. The carriage position is moved to the start of the line.

Format

Decimal	Hex	ASCII
12	0C	FF

Select Half-Speed Printing

Turns on half-speed mode to provide quiet printing, and more accurate print positioning during text mode printing.

Format

Decimal	Hex	ASCII
27 115 1*	1B 73 01*	ESC "s" 1*

Cancel Half-Speed Printing

Turns off half-speed mode (factory default), and continues with normal speed printing.

Format

Decimal	Hex	ASCII
27 115 0*	1B 73 00*	ESC "s" 0*

Set Inactivity Time for Sleep Mode

Sets the amount of time the printer waits before it goes into low-power mode. The factory default is 10 seconds.

Format

Decimal	Hex	ASCII
27 122 n	1B 7A n	ESC "z" n

Line Feed

Perform Line Feed

Prints and then clears the contents of the print buffer, resets the character count to zero; and advances the printhead to the next print line, using the current spacing. The position of the carriage is not affected and a carriage return is not executed.

Format

Decimal	Hex	ASCII
10	0A	LF

Perform n/216-inch Line Feed

Advances the paper to n/216 of an inch. This does not affect subsequent line feeds. Range of *n* is 0 to 255.

Format

Decimal	Hex	ASCII
27 74 n	1B 4A n	ESC "J" n

Perform n/216-inch Reverse Line Feed

Reverses the line feed by n/216 of an inch. This does not affect subsequent line feeds. Range of *n* is 0 to 255.

Format

Decimal	Hex	ASCII
27 106 n	1B 6A n	ESC "j" n

Perform Master Reset

Initializes the printer and restores factory installed printer defaults. For a complete list of settings that are initialized with this command, see **"Factory-Installed Printer Defaults" on page 112**.

Format

Decimal	Hex	ASCII
27 64	1B 40	ESC "@"

Set Print Position (absolute)

Moves the printhead to an absolute horizontal position on the paper. The distance is specified in dots from the left margin to the new print position (at which subsequent characters are printed). Each dot represents 1/60 of an inch. The values for *n1* and *n2* determine the distance, as follows:

```
number of dots = n1 + (n2 * 256)
```

Maximum position is 480. The previous contents of the current print buffer is printed.

If the position specified moves the printhead outside the current margins, the command is ignored and the previous setting remains in effect. This command is also ignored in right, center, and full justification modes.

Format

Decimal	Hex	ASCII
27 36 n1 n2	1B 24 n1 n2	ESC "$" n1 n2

Set Print Position (relative)

Moves the printhead to a horizontal position on the paper, relative to the current printhead position. The distance specified is in dots. To determine *n1* and *n2*, first calculate the displacement required in 1/120ths of an inch. If the displacement is to the left, subtract it from 65536. The values for *n1* and *n2* determine the distance, as follows:

```
number of dots = n1 + (n2 * 256)
```

Maximum displacement is ±960. If the position specified would place the printhead outside the current margins, this function is ignored and the previous setting remains in effect. This function is also ignored in right, center, and full justification modes.

Format

Decimal	Hex	ASCII
27 92 n1 n2	1B 5C n1 n2	ESC "\" n1 n2

Select Top-Down Printing

Enables top-down printing (factory default). The first page is printed first.

Format

Decimal	Hex	ASCII
27 31 0	1B 1F 00	ESC US (0)

Select Bottom-Up Printing

Enables bottom-up printing. The last page is printed first.

Format

Decimal	Hex	ASCII
27 31 1	1B 1F 01	ESC US (1)

Select Unidirectional Printing

Turns on unidirectional printing mode. Unidirectional printing moves the printhead from left-to-right only, allowing for more accurate print positioning during text mode printing.

Format

Decimal	Hex	ASCII
27 85 1*	1B 55 01*	ESC "U" 1*

Cancel Unidirectional Printing

Turns off unidirectional printing (factory default), allowing the printhead to print in both directions.

Format

Decimal	Hex	ASCII
27 85 0*	1B 55 00)	ESC "U" 0*

Select Unidirectional (one line) Printing

Turns on unidirectional printing for the current line only. The contents of the print buffer is printed, and cleared before setting this mode. This allows more accurate print positioning during text mode printing, for the current line.

Format

Decimal	Hex	ASCII
27 60	1B 3C	ESC "<"

Page Formatting Functions

This set of functions consists of control codes that change the formatting of the page. The page length (form length) and margin settings define the printable area on the page. These settings need to conform to the actual size of the paper used in the printer. The line spacing functions set the amount of space from one line to the next, for line feeds. The factory default is 1/6 inch (6 lines per inch). The page length, vertical tab, and skip over perforation functions are also dependent on the line spacing function.

Set Page Length (lines)

Sets the length of the paper in lines, where the range of *n* (number of lines) is 1 to 127 (default = 66). Keep in mind the line spacing and actual length of the paper when specifying this value, since this function is dependent on those parameters. Top-of-Form is reset to the current line and the Skip Over Perforation setting is canceled.

Format

Decimal	Hex	ASCII
27 67 n	1B 43 n	ESC "C" n

Set Page Length (inches)

Sets the length of the paper in inches, where the range of *n* (number of inches) is 1 to 22 (default = 11). Keep in mind the line spacing and actual length of the paper when specifying this value, since this function is dependent on those parameters. Top-of-form is reset to the current line and the Skip Over Perforation setting is canceled.

Format

Decimal	Hex	ASCII
27 67 0 n	1B 43 00 n	ESC "C" NUL n

Select 1/8-inch Line Spacing

Sets the line spacing is set to 1/8 of an inch (8 lines per inch), for subsequent lines.

Format

Decimal	Hex	ASCII
27 48	1B 30	ESC "0"

Select 7/72-inch Line Spacing (7 dots)

Sets the line spacing to 7/72 of an inch (approximately 9.7 lines per inch), for subsequent lines.

Format

Decimal	Hex	ASCII
27 49	1B 31	ESC "1"

Select 1/6-inch Line Spacing

Sets the line spacing to 1/6 of an inch (6 lines per inch), for subsequent lines (factory default). 1/6 inch is equal to 12 dot spacing.

Format

Decimal	Hex	ASCII
27 50	1B 32	ESC "2"

Select n/216-inch Line Spacing

Sets the line spacing to n/216 of an inch, for subsequent lines. A spacing of 1/216 inch is 1/3 the distance between pins of the printhead (approximately 1/3 of a dot) and 27/216 is 8 lines per inch. Range of *n* is 0 to 255.

Format

Decimal	Hex	ASCII
27 51 n	1B 33 n	ESC "33" n

Select n/72-inch Line Spacing (n dots)

Sets the line spacing to n/72 of an inch, for subsequent lines. A spacing of 1/72 inch (1 point in font size) is the distance between pins on the printhead (approximately 1 dot) and 9/72 is 8 lines per inch. Range of *n* is 0 to 85.

Format

Decimal	Hex	ASCII
27 59 n	1B 41 n	ESC "A" n

Set Right Margin

Clears all text in the print buffer and sets the right margin to *n* columns, using the current character pitch. This is the number of the characters from column 1 (at the left edge of the paper) to the last column before the right margin (factory default = 80).

Minimum space between margins is the width of one double-width pica character. Maximum value for this is the maximum number of characters (based on the current pitch) that would fit between the left margin and the right edge of the default printable area of the page. Ranges shown below could vary, depending on values of other parameters that affect character width. If the value specified is not within the allowed range, it is ignored.

Range of *n* is 2 to 80 in Pica mode, 2 to 96 in Elite mode, and 2 to 136 in compressed mode.

Format

Decimal	Hex	ASCII
27 81 n	1B 51 n	ESC "Q" n

Set Left Margin

Clears the print buffer text and sets the left margin, relative to the number of columns to the left of the first column to print (factory default = 0).

Minimum space between margins is the width of one double-width pica character. Maximum value must be less than the right margin. Ranges shown below could vary, pending on other parameter values that affect character width. If the specified value is not within the range, it is ignored.

Range of *n* is 0 to 78 in pica mode, 0 to 93 in elite mode, and 0 to 133 in compressed mode.

Format

Decimal	Hex	ASCII
27 108 n	1B 6C n	ESC "l" n

Set Skip Over Perforation

Defines the number of lines to skip between the last printed line on the page and the first printed line on the next page is set. If the value specified for this function is greater than the page length, it is ignored. This function is canceled by using one of the Set Page Length functions (factory default = disabled). This function is valid for continuous paper only.

The amount of blank space at the bottom of the printed page depends on the Line Spacing.

Format

Decimal	Hex	ASCII
27 78 n	1B 4E n	ESC "N" n

Cancel Skip Over Perforation

Cancels the skip over perforation, which allows the maximum number of lines to print on each page.

Format

Decimal	Hex	ASCII
27 79	1B 4F	ESC "O"

Character Style and Text Mode Functions

The following set of functions affect the appearance of text on the printed page. This could involve size, typeface, or other characteristics of the text.

Select Condensed Character Mode

Selects condensed mode which prints characters at approximately 60% of the normal width. This results in character pitches, as shown below. For more information on exact pitch values, see **"Master Select" on page 51**.

Character Pitches

Condensed Mode	Condensed + Expanded	Condensed + Elite
17 cpi (approximate)	9 cpi (approximate)	20 cpi (approximate)

This function empties the print buffer and turns compressed mode on, and stays on until canceled by cancel compressed mode, ESC SI or DC2 (factory default = disabled).

Note: This function is not supported in Double-Byte Character Sets (DBCS).

Format

Decimal	Hex	ASCII
27 15	1B 0F	ESC SI
15	0F	SI

Cancel Condensed Character Mode

Cancels the compressed mode, enabled by select compressed mode, SI or ESC SI (1).

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 18	1B 12	DC2
18	12	DC2

Select Double-Strike Mode

Enables double-strike printing until it encounters cancel double-strike mode. Factory default disables double-strike. Text is bolded by printing each dot twice, with the second dot slightly below the first dot. This mode is not available in NLQ, but is not canceled when you select NLQ.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 71	1B 47	ESC "G"

Cancel Double-Strike Mode

Cancels double-strike mode.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 72	1B 48	ESC "H"

Select Double-Wide Mode

Enables expanded print for the current line only. The mode set previously returns on subsequent lines. However, expanded print can be canceled with cancel expanded print, DC4 or ESC "W" (0), before end of current line, or wrapping of the print buffer. This works with all three pitches (Pica, Elite, Compressed).

This mode is also terminated by the execution of a Carriage Return, Line Feed, Form Feed, Vertical Tab or wrapping of the print buffer.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 14	1B 0E	ESC SO
14	0E	SO

Cancel Double-Wide Print

Cancels expanded print for the current line only. Modes set previously return on subsequent lines. However, it does not cancel expanded mode set by select double-wide (expanded) mode, ESC "W" (1) or Master Select, ESC "!".

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 20	1B 14	DC4
20	14	DC4

Select Double-Wide Print

Enables expanded print until Cancel Expanded Print is encountered. Factory default disables double-wide mode.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 87 1*	1B 57 01*	ESC "W" 1*

Cancel Double-Wide Print

Cancels double-wide print mode.

Note: This function is not supported in DBCS.

Decimal	Hex	ASCII
27 87 0*	1B 57 00*	ESC "W" 0

Select Elite Pitch

Selects acharacter pitch of 12 cpi (characters per inch). Also cancels pica pitch (factory default = Pica).

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 77	1B 4D	ESC "M"

Select Emphasized Print Mode

Enables emphasized print mode until cancel emphasized mode is encountered. The text is made bolder by printing each dot twice, with the second dot slightly to the right of the first dot. Factory default disables emphasized mode.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 69	1B 4B	ESC "E"

Cancel Emphasized Print Mode

Cancels emphasized print mode.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 70	1B 46	ESC "F"

Define Intercharacter Space

Defines the amount of space to the right of each character, in addition to the space allowed in the character design. The variable *n* represents the number of units of space, with each unit equal to 1/120 of an inch. Range of values for *n* is 0 to 63 with a factory default of 0.

Format

Decimal	Hex	ASCII
27 32 n	1B 20 n	ESC SP n

Select Italic Mode

Italicized the text (nongraphic) characters. Factory default disables italic mode.

Note: This function does not work well with DBCS or alternate Single Byte Character Sets (SBCS).

Format

Decimal	Hex	ASCII
27 52	1B 34	ESC "4"

Cancel Italic Mode

Cancels the italic mode.

Note: This function does not work well with DBCS or alternate Single Byte Character Sets (SBCS).

Format

Decimal	Hex	ASCII
27 53	1B 35	ESC "5"

Master Select

Allows you to specify a combination of print modes. The variable *n* is determined by combining values for the desired modes, by adding them together.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 33 n	1B 21 n	ESC "!" n

Valid combinations of the values in the following table include any combinations except that Pica cannot combine with Elite.

Example

Pica Compressed Italic Underlined, by adding values (00h + 04h + 40h + 80h), which results in C4h for the value of *n*.

Master Select Values

Hex Value	Mode
00h	Pica
01h	Elite
04h	Condensed (compressed)
08h	Emphasized
10h	Double-Strike
20h	Double-Width (expanded)
40h	Italic
80h	Underlined

The following print conflicts occur between modes. A mode in any column takes precedence over all modes in the columns to its right.

Print Conflicts

1	2	3
Elite	Emphasized	Compressed

The following print modes can be combined producing different pitches:

Print Modes

Pitch	Mode
5 cpi	Expanded
6 cpi	Expanded Elite
8.58 cpi	Expanded Compressed
10 cpi	Pica
12 cpi	Elite
17.16 cpi	Compressed

Select Pica Pitch

Select a character pitch of 10 cpi (characters per inch) (factory default). This also cancels Elite pitch.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 60	1B 50	ESC "P"

Select Superscript Mode

Prints all subsequent characters in approximately 2/3 the normal height in the upper part of the character space, until is encounters Cancel Subscript/Superscript.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 83 0*	1B 53 00*	ESC "S" 0*

Select Subscript Mode

Prints all subsequent characters in approximately 2/3 the normal height in the lower part of the character space, until it encounters Cancel Subscript/Superscript.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 83 1*	1B 53 01*	ESC "S" 1*

Cancel Subscript/Superscript Mode

Cancels the effects produced by select superscript mode and select subscript mode. Factory default also disables both of these modes.

Note: This function is not supported in DBCS.

Format

Decimal	Hex	ASCII
27 84	1B 54	ESC "T"

Select Underline Mode

Enables the underlining of all subsequent characters (including spaces) until it encounters the cancel underline mode function.

Format

Decimal	Hex	ASCII
27 45 1*	1B 2D 01*	ESC "–" 1*

Cancel Underline Mode

Cancels the effect of the select underline mode. Factory default also disables the underline mode.

Format

Decimal	Hex	ASCII
27 45 0*	1B 2D 00*	ESC "–" 0*

Tabs and Tab Setting Functions

There are control codes for setting horizontal and vertical tabs.

Horizontal tabs:

- Are not affected by subsequent changes in pitch.
- May range up to maximum width for character and printer size.
- All previous tab stops are cleared when new tab stops are set. If the left margin is changed after the horizontal tabs are set, tab stops are cleared.
- Become absolute positions and are not affected by any subsequent change in character size.
- Set outside of the printable area are ignored.

Vertical tabs:

- Tab positions are line numbers, counting from the Top of Form.
- All tabs set beyond the page length are stored, but are not used.

- Any tab set within the SOP range (Skip Over Perforation), during the time SOP is active, are stored but not used until SOP is canceled.

- If a vertical tab, and the next tab stop is outside the printable page area, a form feed is executed placing the printhead at the next Top of Form.

- Previous tab stops are cleared when new tab stops are set.

- Are not affected by subsequent changes in line spacing.

Perform Horizontal Tab

Moves the print position to the next horizontal tab stop. The tab positions, set by ESC "D", the Set Horizontal Tabs function, are not affected by any changes in character pitch.

The factory default tab settings are at intervals of eight characters, in the currently selected pitch. For the default tabs, the actual distance to each tab position is affected by changes in character pitch.

Format

Decimal	Hex	ASCII
9	09	HT

Set Horizontal Tabs

Resets the current horizontal tabs, and new horizontal tabs are set up, based on the current character width (pitch).

Format

Decimal	Hex	ASCII
27 68 n1 n2 ..nk 0	1B 44 n1 n2 .. nk 00	ESC "D" n1 n2 .. nk NUL

n1 is the first tab (range for tab stops is 1 to 160), *n2* is the second tab (all tabs in ascending order), ... are subsequent tabs (maximum tabs: 32), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), *NUL* is the terminating character.

Clear Horizontal Tabs

Clears all horizontal tab stops. It is merely a variant behavior of the Set Horizontal Tabs function, where the *NUL* acts as an early terminating character, as existing tabs normally clear before setting any new tabs.

Format

Decimal	Hex	ASCII
27 68 0	1B 44 00	ESC "D" NUL

Perform Vertical Tab

Prints the contents of the current print buffer, and then moves the print position to the next vertical tab stop. If no channel is selected, then channel 0 is used. The carriage position is changed to the start of the next print line. If the vertical tab is performed beyond the last tab position set or beyond the last line of a form, then a form feed is performed. If no vertical tabs are defined, then the paper advances one line, using the currently selected line spacing, without changing the carriage position.

Format

Decimal	Hex	ASCII
11	0B	VT

Set Vertical Tabs

Resets the current tabs. Vertical tabs are set up based on the current line spacing. Tab settings are not affected by subsequent changes in line spacing.

Format

Decimal	Hex	ASCII
27 66 n1 n2 .. nk 0	1B 42 n1 n2 .. nk 00	ESC "B" n1 n2 .. nk NUL

n1 is the first tab (range of values for tab stops is 1 to 255), *n2* is the second tab (all tabs must be in ascending order), ... are subsequent tabs (maximum number of tabs: 16), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), *NUL* is the terminating character. All tab settings with this function are stored in channel 0.

Clear Vertical Tabs
Clears all vertical tab stops. This is a variant behavior of the Set Vertical Tabs function, where the *NUL* acts as an early terminating character.

Format

Decimal	Hex	ASCII
27 66 0	1B 42 00	ESC "B" NUL

Set Vertical Tabs in Channel
This function works the same as the Set Vertical Tabs function, except that it stores the tabs into a specified channel, as specified by the variable *c*. This channel is selected for use by the Select Vertical Tab Channel function.

Format

Decimal	Hex	ASCII
27 98 c n1 n2 .. nk 0	1B 62 c n1 n2 .. nk 00	ESC "b" c n1 n2 .. nk NUL

c is the channel number (range is 0 to 7), *n1* is the first tab (range of values for tab stops is 1 to 255), *n2* is the second tab (all tabs must be in ascending order), ... are subsequent tabs (maximum number of tabs is 16), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), and *NUL* is the terminating character.

Clear Vertical Tabs in Channel

Clears all vertical tab stops in the specified channel. This is a variant behavior of the Set Vertical Tabs in Channel function, where the *NUL* acts as an early terminating character, since this function normally clears the existing tabs before setting any new tabs.

Format

Decimal	Hex	ASCII
27 98 c 0	1B 62 c 00	ESC "b" c NUL

Select Vertical Tab Channel

Selects a specified vertical tab channel. It sets up the current tabs from that channel. Once this function is performed, all subsequent Perform Vertical Tab commands use the tab stops from the list retrieved from the specified channel. At power on, the printer uses the tabs stored in channel 0.

Format

Decimal	Hex	ASCII
27 47 c	1B 2F c	ESC "/" c

c is the channel number (range: 0 to 7).

Using Character Sets and User-Defined Functions

You can install different character sets on the printer. In some cases more than one character set may be present at one time, depending on the amount of available font memory. The 6820 reserves 438 K of memory for installing fonts in flash memory. You can install fonts using NPCP or the Printer Configuration Utility.

Single-Byte Character Sets

Single-byte character sets (SBCS) are supported for MS-DOS, PL/N, and Intermec application compatibility. Nft00000.mod is the default character set (font) for compatibility with the 6820 Nft00437.mod is the IBM/Microsoft compatible character set for Code Page 437.

Double-Byte Character Sets

Double-byte character (DBCS) sets require two bytes to send to the printer to define the character to print. The first byte of the character code sent to the printer is known as a lead-in byte. The second byte of the character code is known as the trailing byte. Different character sets have different requirements for the values of both lead-in and trailing byte. When the lead-in byte does not fall in the range listed for the character set, a character from a SBCS may print. The following double-byte character sets are supported by the 6820.

Double-Byte Character Sets

Font Module	Code Page	DBCS Languages	Lead-in Byte	Trailing Byte
nft00936.mod	936	GB 2312 Chinese (simplified)	A1h–ABh B0h–F7h	A1h–FEh
nft00950.mod	950	big 5 Traditional Chinese	A1h–C6h C9h–F9h	40h–FEh (except 7Fh)
nft00932.mod	932	Shift JIS Japanese	81h–9Fh E0h–FCh	40h–FCh (except 7Fh)
nft00949.mod	949	KSC 5601 Korean	A1h–ACh B0h–C8h CAh–FDh	A1h–FEh

Multi-Byte Character Sets

Double-byte character sets and single-byte character sets can mix when printing a report. This mixture is referred to as a Multi-Byte Character Set (MBCS). When a DBCS is selected, the characters from the SBCS code page currently selected are used for rendering character codes and control codes from 0 to 127. Codes above 127 (that fall within the range of lead-in bytes for the selected character set) treat the byte that follows as a trailing byte for that character set. Otherwise, for character codes above 128, the character code from the selected SBCS is printed. NFT00950.MOD (BIG 5 DBCS) does not allow the MBCS mode. For this character set, only control codes from 0 to 31 are treated as single byte characters when they are not proceeded by a lead-in byte. All escape sequence character strings are treated as SBCS.

Select National Character Set

By default, code page 0 is selected by the printer at reset. Use the following escape sequence to select international character support. Escape sequence codes can only be used for code page 0. All other code pages use direct character code mapping to select the appropriate font for rendering.

n is 0 to 14 and is the country code, as shown in the International Character Sets table. The default value for *n* is zero (USA).

Format

Decimal	Hex	ASCII
27 82 n	1B 52 n	ESC "R" n

A full 256 character set is not provided for these sets. There are 64 international characters stored in ROM, 32 in Roman and 32 in Italic. They are stored as codes 0 to 31 and 128 to 255. These are normally not accessible. The ESC "R" command makes these codes available, but only 12 characters at a time. These 12 are available in these positions of the ASCII character table: 35, 36, 64, 91, 92, 93, 94, 96, 123, 124, 125, and 126, as shown in the International Character Sets table.

International Character Sets

Country	Country Number	35	36	64	91	92	93	94	96	123	124	125	126
USA	0	#	$	@	[	\	]	^	`	{	|	}	~
France	1	#	$	à	º	ç	§	^	`	é	ù	è	¨
Germany	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	b
England (UK)	3	£	$	@	[	\	]	^	`	{	|	}	~
Denmark 1	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	5	#	≠	É	Ä	Ö	Å	Ü	é	ä	Ö	å	ü
Italy	6	#	$	@	º	\	é	^	ù	à		è	ì
Spain 1	7	P	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Japan	8	#	$	@	[	¥	]	^	`	{	|	}	~
Norway	9	#	≠	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

International Character Sets (continued)

Country	Country Number	35	36	64	91	92	93	94	96	123	124	125	126
Denmark 2	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain 2	11	#	$	á	¡	Ñ	¿	é	'	í	ñ	ó	ú
Latin America	12	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
Hebrew	13	Hebrew fonts are available in the supplied font files. See the Hebrew Character Set table.											
Greece	14	Greek fonts are available in the supplied font files. See the **"Greek Character Set" on page 62**.											

Hebrew Character Set

Hebrew characters represented by decimal values 38 and 65 through 90 are represented by the following 7×7 font descriptions.

```
*.*.*..  ....*.*  *.*.*.*  *.*.*.*  ....*.*  *.*.*.*  *.*.*.*  *...*.*.
....*..  ......*  ......*.  .....*.  ......*  ...*...  .*...*.  *..*..*
....*..  ....*.*  ......*  *....*  ......*  ...*...  *....*.  *..*..*
....*..  ...*..*  ......*  *....*  ......*  ...*...  *....*.  *.....*
*.*.*.*  ..*...*  ......*.  *....*.  ......*  ...*...  *....*.  *.....*.
.......  .......  .......  .......  .......  .......  .......  *.*.*..
.......  .......  .......  .......  .......  .......  .......  .......
65      66      67      68      69      70      71      72

.......  .......  .......  ....*..  .......  .......  .......  .......
....*.*  ..*.*.*  *.*.*..  *.*.*.*  *.*.*.*  *..*..  ....*.*  ....*.*
......*  ......*  ......*  ......*  *......*  .*.*.*  ......*  ......*
......*  ......*  ......*  .....*.  *......*  ..*...*  ......*  ......*
......*  ......*  .....*.  ....*..  *......*  .*...*  ......*  ......*
....*.*  *.*.*..  .*.*.*.  *.*.*.*  *...*.*  ......*  ..*.*.*
.......  .......  .......  .......  .......  .......  .......  .......
.......  .......  .......  .......  .......  .......  .......  .......
73      74      75      76      77      78      79      80

*.*.*.*  *.....  *.*.*.*  *.*.*..  *.....*.  *.....*  *.*.*.*  *.*.*.*
..*...*  *....*  *.....*  *......*  *.*.*.  .*...*.  .......*  ......*
.*....*  .*....*.  *.*....*  *.*...*  ..*.*.  ...*...  .*....*  .....*
*.....*.  ...*.*  .....*  ......*  .....*.  *.*.*.*  ......*
*.*.*..  *.*.*.*  ......*  *.*.*..  ....*  *.*.*.*  *......  ......*
.......  .......  .....*  .......  ....*  .......  *......  .......
```

```
. . . . . . .   . . . . . . .   . . . . . . .   . . . . . . .   . . . . . . .   . . . . . . .   . . . . . . .   . . . . . . .
 81          82          83          84          85          86          87          88
```

```
. . . . . *. .   . . . . . . .   . . . . . . .
*. . *. . *   . . *. *. *   *. . . . . *
*. . *. . *   . . *. . . *   . *. . . . *
*. . *. . *   . . *. . . *   . *. *. *.
*. *. . *.   . . *. . . *   *. . . . *.
*. . . *. .   *. *. . . *   *. . . . . *
. . . . . . .   . . . . . . .   . . . . . . .
. . . . . . .   . . . . . . .   . . . . . . .
 89          90          91
```

Greek Character Set

Dec	Hex	Chr	Dec	Hex	Chr	Dec	Hex	Chr
97	61	A	105	69	I	113	71	P
98	62	B	106	6a	K	114	72	S
99	63	G	107	6b	L	115	73	T
100	64	D	108	6c	M	116	74	Y
101	65	E	109	6d	N	117	75	F
102	66	Z	110	6e	X	118	76	X
103	67	H	111	6f	O	119	77	Y
104	68	q	112	70	P	120	78	W

The selected set stays in effect until the printer is reset and receives a Master Reset command, or until you select a new international character set.

Note: This function is only used with the default character set.

User Defined Characters

This section describes user-defined characters and how characters are copied into printer memory.

Note: RAM-based definition or redefinition of standard characters is only useful when the default SBCS code page is selected. There is no method to redefine characters in the other code pages since unique code pages can be created and loaded into the printer memory.

Copy ROM to RAM

The characters in ROM are copied into RAM, so a complete user-defined character set is created by editing selected characters. This ensures that all characters are defined when a user-defined character set is selected. This eliminates the need to cancel the selection when printing defined characters.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 58 0 0 0	1B 3A 00 00 00	ESC "." NUL NUL NUL

Define User Defined Characters

Characters are redefined by the user in the currently selected mode. However, they can only be used in draft mode.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 38 0 k1 k2 s1 d1 ... d11	1B 26 00 k1 k2 s1 d1 ... d11	ESC "&" k1 k2 s1 d1.....d11

k1 is the character code of the first character to redefine, *k2* is the character code of the last character to redefine (any character between 0-255 can be redefined), and (*k1* could equal *k2*, if only one character is defined).

For each character defined, you must supply 12 bytes of data.

- *s1* is the first byte that describes the character format.

- Bits 0 to 3 represent the end position in the grid.

- Bits 4 to 6 represent the start position in the grid.

- Bit 7 determines whether the character uses the top eight pins or the bottom eight pins of the printhead. If bit 7 = 0, the top eight pins are used. If bit 7 = 1, the bottom eight pins are used. The start and end positions are ignored during character imaging, but must be accurate to redefine the character code. d1...d11 is the data that comprises the dot image pattern of the defined character.

When printable code expansion is enabled with ESC I, the Printable Code Area Expansion function, and the user-defined character set is selected with ESC "%" (1), the Select User-Defined Set function, then the codes (less than 20h and greater than 7Fh) can be defined for use and are printable.

When printable code expansion is enabled with the Enable Printing of Codes 128-159 function, and the user-defined character set is selected with the Select User-Defined Set function, then codes (between 80h and 9Fh) can be defined for use and are printable.

For a list of these characters, see the **"Expand Printable Code Area" on page 66**.

Select User-Defined Character Set
After you define a character set using the Define User-Defines Characters function, you can select a user-defined character set.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 37 1	1B 25 01	ESC "%" (1)

Select Default Character Set

If the Select User-Defined Set function was previously set, this function switches back to the default character set.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 37 0	1B 25 00	ESC "%" (0)

Enable Printing of Codes 128-159

All codes (128-159) are treated as printable characters, rather than control codes, with this function. This allows the use of these characters for user-defined characters. A user-defined set must be selected, using the Select User-Defined Set function, before these characters can print. Factory default disables printing of these codes.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 54	1B 36	ESC "6"

Disable Printing of Codes 128-159

Disables the printing of codes 128-159. By default, these codes are disabled.

Format

Decimal	Hex	ASCII
27 55	1B 37	ESC "7"

Expand Printable Code Area

This function allows certain ASCII codes (00h to 1Fh) and codes (80h to 9Fh) to print when the variable *n* is set to the value of 1. This allows the use of these codes for user-defined characters. If n = 0, the function returns these two ranges of characters to non-printable control codes. A user-defined character set must be selected by ESC "%" (1), the Enable Printing of Codes 128-159 function, before these codes can print.

Note: This function is only useful with the default SBCS.

In both ranges, only the following codes can redefine as printable characters. Codes not listed, within the range (00h to 1Fh), print as standard control codes. Codes not listed, within the range (80h to 9Fh), are converted to a control code in the range of (00h to 1Fh), by subtraction of 80h.

Format

Decimal	Hex	ASCII
27 73 n	1B 49 n	ESC "I" n

Printable Code Expansion Characters

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	NUL	11	DC1	80	none	91	none
01	SOH	15	NAK	81	none	95	none
02	STX	16	SYN	82	none	96	none

Printable Code Expansion Characters (continued)

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
03	ETX	17	ETB	83	none	97	none
04	EOT	1C	FS	84	none	9C	none
05	ENQ	1D	GS	85	none	9D	none
06	ACK	1E	RS	86	none	9E	none
10	DLE	1F	US	90	none	9F	none

Enable Printing of Character Graphics

Enables the printing of character graphics, until disabled with the Disable Printing of Character Graphics function.

Note: This function is only useful with the default SBCS.

Format

Decimal	Hex	ASCII
27 116 1	1B 74 01	ESC "t" (1)

For character values from 0 to 31 (00h to 1Fh):

- When the default SBCS code page is selected, the FX-86e IBM character graphics symbol set is printed.
- When other SBCS code pages are selected, the codes (00h to 1Fh), listed above in the Printable Code Expansion Characters table are printed.

For character values from 32 to 126 (20h to Eh):

- When the default SBCS code page is selected, the selected international character set is printed.
- When other SBCS code pages are selected, the international character set selection is not in effect.

For the character value 127 (7Fh):

- When the default SBCS code page is selected, a space is printed

- When other SBCS code pages are selected, the character associated with the code page is printed.

For character values from 128 to 255 (80h to FFh), the FX-86e Epson Character Graphics set is printed.

Disable Printing of Character Graphics

Disables the printing of character graphics. Factory default disables this function.

Format

Decimal	Hex	ASCII
27 116 0	1B 74 00	ESC "t" (0)

Enable Printing of Character Graphics

This function allows printing of character graphics from the currently selected SBCS code page, by sending a graphics string to the printer. The values of the graphics data bytes can range from 0 to 255.

Format

Decimal	Hex	ASCII
27 43 n d1 ... dn	1B 2B n d1 ... dn	ESC "+" n d1 ... dn

n is the length of the character graphic string and *d1 ... dn* are the character graphics data stream.

The number of data bytes must be equal to the value of the variable n. The range of values (for the characters in each graphics data byte) is 0 to 255.

For character values from 0 to 31 (00h to 1Fh):

- When the default SBCS code page is selected, the FX-86e IBM character graphics symbol set is printed.

- When other SBCS code pages are selected, currently selected single byte code page character graphics are printed.

For character values from 32 to 126 (20h to 7Eh):

- When the default SBCS code page is selected, the selected international character set is printed.
- When other SBCS code pages are selected, the character from the currently selected code page are printed.

For the character value 127 (7Fh):

- When the default SBCS code page is selected, a space is printed

- When other SBCS code pages are selected, the character graphics symbol is printed.

For character values from 128 to 255 (80h to FFh):

- When the default SBCS code page is selected, the FX-86e Epson Character Graphics set is printed.

- When other SBCS code pages are selected, the corresponding character is printed.

Graphics Functions

Eight-Pin Graphics Modes

All 8-pin graphics functions require parameters, *n1* and *n2*, which represent the length of the graphics string that follows the select graphics mode command, and are calculated using a temporary variable, *n*.

- *n* = total number of graphics dots needed for the graphic string

- *n2* = integer of (*n* divided by 256)

- *n1* = remainder of the *n2* calculation

The simplest calculation, is to divide *n* (total number of dots needed for the graphics string) by 256. Then *n2* is the quotient (the whole number) and *n1* is the remainder. If you require less than 256 dots (columns), then *n1* indicates the number of dots and *n2* is set to zero.

Select Graphics Mode

Enables the graphics mode represented by the variable m in the Graphic Modes table. The total number of dot columns to print is represented by *n1* and *n2*. Any graphic string that exceeds the length of the print line is discarded.

Format

Decimal	Hex	ASCII
27 42 m n1 n2	1B 2A m n1 n2	ESC "*" m n1 n2

Reassign Graphics Mode

Changes graphic modes.

Format

Decimal	Hex	ASCII
27 63 s n	1B 3F s n	ESC "?" s n

s is one of the K, I, Y, or Z characters and *n* is one of the 0 to 7 modes as shown in the Graphic Modes table.

Graphic Modes

Mode	n	Dots per Inch / Dots per 8 in Line
Single-dDensity	0	60 dots per inch, 480 dots per 8 in line
Low Speed Double-Density	1	120 dots per inch, 960 dots per 8 in line
*High Speed Double-Density	2	120 dots per inch, 920 dots per 8 in line
*Low-Speed Quadruple-Density	3	240 dots per inch, 1920 dots per 8 in line
CRT I	4	60 dots per inch, 480 dots per 8 in line
Single–Density Plotter	5	72 dots per inch, 576 dots per 8 in line
CRT II	6	90 dots per inch, 720 dots per 8 in line
*Double-Density Plotter	7	144 dots per inch, 1152 dots per 8 in line

*Adjacent dots in a given row cannot be printed in these modes.

Select Single Density Graphics Mode

This is a simple method of printing graphics. The resolution is 60 dots per inch. Each 8-inch line can accommodate 480 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. For more information on calculating the parameters, *n1* and *n2*, see **"Nine-Pin Graphics Modes" on page 73**.

Format

Decimal	Hex	ASCII
27 75 n1 n2	1B 4B n1 n2	ESC "K" n1 n2

Select Low-Speed Double Density Graphics Mode

If Single Density graphics does not produce high enough density, try this mode. The number of dots per inch is doubled. However, the speed is reduced to half of what it would be with single density. For more information on calculating the parameters, *n1* and *n2*, see **"Nine-Pin Graphics Modes" on page 73**.

This is 8-pin single density graphics. The resolution is now 120 dots per inch. Each 8-inch line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

Format

Decimal	Hex	ASCII
27 76 n1 n2	1B 4C n1 n2	ESC "L" n1 n2

Select High-Speed Double Density Graphics Mode

This 8-pin graphics mode produces the same density as the Low-Speed Double Density mode, however, the speed is doubled. For more information on calculating the parameters, *n1* and *n2*, see **"Nine-Pin Graphics Modes" on page 73**.

Format

Decimal	Hex	ASCII
27 89 n1 n2	1B 59 n1 n2	ESC "Y" n1 n2

The resolution is still 120 dots per inch. Each 8-in line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. Make sure adjacent dots in a given dot row are not printed.

Select Low-Speed Quadruple Density Graphics Mode

With this 8-pin graphics mode, the number of dots per inch has gone up to 4x what it was in single density. Calculating the parameters, *n1* and *n2*, is described below.

Format

Decimal	Hex	ASCII
27 90 n1 n2	1B 5A n1 n2	ESC "Z" n1 n2

The resolution is now 240 dots per inch. Each 8-in line can accommodate 1920 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. Make sure adjacent dots in a given dot row are not printed.

Nine-Pin Graphics Modes

These 9-pin graphics functions also require two parameters, *n1* and *n2*. They are calculated slightly different than in the 8-pin graphics modes. Since two data bytes represent each dot column to print, first divide the total length of the graphic string (following the Select Graphics Mode command) by two. These parameters are calculated as follows (assuming a temporary variable *n*):

- *n* = total number of dots needed, divided by 2

- *n2* = integer of (*n* divided by 256)

- *n1* = remainder of the *n2* calculation

First, divide *n* (the total number of dots needed for the graphics string) by 2, then divide the result by 256. Then *n2* is the quotient (the whole number) and *n1* is the remainder. If you require less than 256 dots (columns), then *n1* indicates the number of dots and *n2* is set to zero.

Select 9-Pin Single Density Graphics Mode

Enables single density 9-pin graphics mode. Calculating the parameters, *n1* and *n2*, are described previously under nine-pin graphics modes.

Format

Decimal	Hex	ASCII
27 94 0 n1 n2	1B 5E 00 n1 n2	ESC "^" (0) n1 n2

The resolution is 60 dots per inch. Each 8-in line can accommodate 480 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

Select 9-Pin Double Density Graphics Mode

Enables double density, 9-pin graphics mode. The parameters, *n1* and *n2*, are described previously under 9-pin graphics modes.

Format

Decimal	Hex	ASCII
27 94 1 n1 n2	1B 5E 01 n1 n2	ESC "^" (1) n1 n2

The resolution is now 120 dots per inch. Each 8-inch line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

5

Troubleshooting and Maintaining the 6820

This chapter helps you correct printing problems that may occur. If you experience a printing problem, you can perform several tests to find and possibly correct the problem. In this chapter you will find these sections:

- **Troubleshooting Basics**
- **Aligning the Printer Mechanism**
- **Understanding Printer Errors**
- **Troubleshooting Using the Printer Self-Test**
- **Understanding Diagnostic Information**
- **Cable Configurations**
- **Cleaning the Printer**
- **Changing the Ribbon Cartridge**
- **Cleaning the Mask Spring**

Troubleshooting Basics

The printing system is composed of four basic components: power source, printer, computer, and communications. Any one of these components can prevent the printer from functioning properly.

Checking the Power Source

Press any button on the printer control panel. If there is power, the power indicator (green LED) turns on and the printhead moves to its starting position. If the printer emits beeps and any of the other indicators light up or flash, observe the number of beeps and indicator flashes and see **"Printer Failure Indicators" on page 80**.

If there is no reaction from the printer after you press a button on the control panel, or if the power LED blinks, verify that the power cables are properly connected between the printer mechanism and its power source (internal battery, vehicle cable, or ac). If none of these steps "wake" up the printer with the problem, then you need to return the printer for service.

- **Internal battery**
  Check the battery and its cable by installing into a known-good printer.

- **Vehicle cable**
  Attach the printer in question to another vehicle power cable or another printer to the vehicle cable you are using.

- **AC power**
  Plug the printer into another outlet.

Testing the Printer

If the power indicator works properly and the printer still does not print, then printer errors are noted. If any indicators light when you press the **Set Page** button, or the printer beeps, see **"Printer Failure Indicators" on page 80** to determine the problem.

If the beep codes and LEDs do not indicate the listed conditions, but the printer does not perform properly, perform a printer self-test. Press and hold the **Form Feed** and **Set Page** buttons until the printer beeps and all indicator lights turn on. As the test progresses, the lights change.

At the end of the self-test, the printer generates a report the verifies the following information:

- Errors detected during self-test

- Error history

- Communication configuration

If the printer self-test report does not print, reset the printer. If the report does print after resetting, then the printer is all right and the reason the printer does not respond to PC print requests is probably communications or PC related. If the report is partially completed, and a printer error occurs during the printing of self-test, see **"Printer Failure Indicators" on page 80**.

Perform a power-on-self-test (POST) to test for errors either by resetting the printer or powering it up. If errors occur, audible error codes, along with indicator light status, are produced during POST. For more information on these error codes, see **"POST Error Codes" on page 81**.

If the POST completes without error, try the printer self-test again. If the self-test prints correctly, but the printer does not respond to the PC, then the problem may be related to communications or PC problems.

Testing Communications/PC

Use the self-test report to verify that the communications protocol options, selected at the printer, match those expected by the host. For information on the self-test report see **"Running the Self-Test" on page 84**. If communication protocol options are incorrect, reconfigure the printer as described in **"Setting the 6820 Configuration" on page 27**.
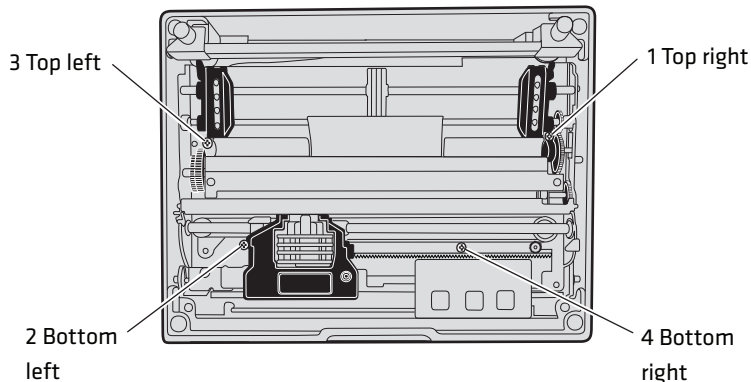
Aligning the Printer Mechanism

If head jams occur, you may need to align the printer mechanism.

To align the printer mechanism

1   Open the printer top cover, install a ribbon cartridge, and position the printhead to the far left toward the green thumbwheel. For more information on how to install a ribbon cartridge, see **"Installing the Ribbon Cartridge" on page 11**.
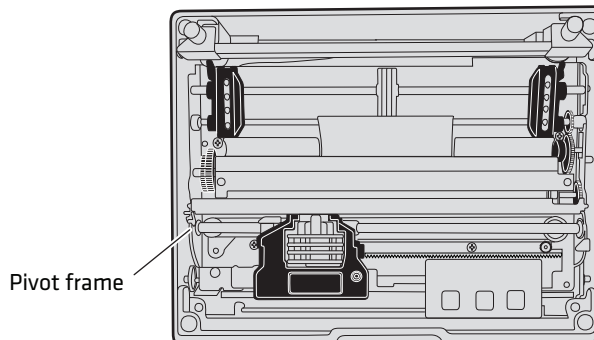
Pivot frame

2   Check the area between the printhead and the printer cavity. If the ribbon cartridge touches the pivot frame, the printer mechanism needs realignment.

3   Loosen the four screws that hold the mechanism in place using a Phillips screwdriver.

3 Top left

1 Top right

2 Bottom left

4 Bottom right

4   Push the printer mechanism to the right away from the green thumbwheel.

5 Press the right side of the printer mechanism to the back as far as it will go.

Note: When in this position, do not allow the left side to touch the pivot frame. The right back edge of the printer mechanism may touch the pivot frame.

6 Hold the printer mechanism in place and tighten the screws in the sequence shown.

Understanding Printer Errors

Printer errors are divided into classes:

• Runtime errors

• Power-On-Self-Test (POST) errors

• Fatal errors (consisting of flash write errors and EEPROM block errors)

Runtime Errors

Runtime errors can occur during the course of printing. These errors are displayed on the LEDs, along with beep sequences. This causes the printer to stop printing and enter an error state. Then beep sequences are emitted, LED codes are displayed, the error status may be sent to the host (depending on the protocol), and the printer goes into suspend mode.

The printer exits from the suspend mode when the user presses one of the keyboard keys or communications is resumed from the host. The printer also places the printhead in its home position and attempts to recover from the error condition. Until the error condition is corrected, the error procedure does not end, and the error state is not removed.

For paper out errors, load paper and press the **Set Page** button before printing begins. Press the **Form Feed** button to load the paper to the top of form. The following table provides a listing of printer failure indicators and describes what they mean.

Printer Failure Indicators

Sets of Beeps	Paper Out	Head Jam	Low Batt	Meaning
1 beep	Off	Off	On	12 V under voltage fault (Low Battery)
1 set of 2 beeps	Off	Off	2 blinks	12 V over voltage fault (Input Voltage too high)
1 set of 3 beeps	Off	Off	3 blinks	24 V under voltage fault (internal power supply failure)
1 set of 4 beeps	Off	Off	4 blinks	24 V over voltage fault (internal power supply failure)
1 set of 13 beeps	Off	Off	Off	Configuration error
2 sets of 2 beeps	Off	2 blinks	2 blinks	printhead over temperature
2 sets of 3 beeps	On	Off	Off	Paper Out
2 sets of 4 beeps	Off	On	Off	Head Jam
5 sets of 2 beeps	5 blinks	5 blinks	5 blinks	Paper feed current fault (Possible paper jam or feed motor failure)
3 sets of 2 beeps	3 blinks	Off	3 blinks	printhead over current (printhead failure)
3 sets of 4 beeps	Off	3 blinks	Off	Home switch failure
4 sets of 2 beeps	4 blinks	4 blinks	Off	printhead short (printhead failure)
12 sets of 12 beeps	Off	Off	Off	Operating System software failure

Note: The most common errors are Paper Out, Low Battery, and Head Jam. Status indicators on the front panel alert you to these errors. For a description see **"Understanding the Status Indicators" on page 3**.

Troubleshooting Using the Power-On-Self-Test (POST)

When you reset the printer, a POST runs to determine why the printer might be failing. Audible error codes, along with indicator light status, are produced during POST if an error occurs. See the POST Error Codes table.

To perform a POST

1 Open the printer case.

2 Insert the printer diagnostic cable into the phone jack on the printer and then connect the 9-pin D-sub plug to your PC. The cable is used during POST to configure the printer, access printer diagnostics, update software, and install new fonts.

3 Press the **Reset** button to start the POST. When the POST starts, the power LED will come on followed by a single beep indicating that the printer is active.

Note: After the test is completed, all LEDs turn off and the printhead moves to the home position. Only runtime errors or fatal errors are reported until the next time the printer is reset and POST is performed.

The printer emits beeps and flashes the LEDs to indicate the cause of any POST errors. POST error codes are described in the following table.

POST Error Codes

Long Beep	Short Beep	Paper Out	Head Jam	Low Batt	Power	Meaning
0	1	Off	Off	Off	On	Operational
0	0	Off	Off	Off	Off	No Power
0	0	Off	Off	Off	On	Control program Initial Program Load (IPL) successful
1	1	Off	On	Off	On	Invalid CRC on boot block
1	2	Off	On	On	On	Invalid CRC on control program or program not found
1	4	Off	Off	Off	On	Upper 192K RAM failure
1	4	Off	Off	On	On	Upper 64K RAM failure
0	0	On	Off	Off	On	Diagnostic mode command check

POST Error Codes (continued)

Long Beep	Short Beep	Paper Out	Head Jam	Low Batt	Power	Meaning
1	5	On	Off	On	On	Diagnostic flash memory check failed or is not initialized
1	5	On	On	Off	On	Diagnostic memory write failure
0	0	On	On	On	On	Control program IPL

Understanding Fatal Errors

There are two types of fatal errors, flash write errors and EEPROM configuration block errors. These errors are extremely rare, but measures are built into the printer diagnostics to track possible occurrences.

Flash Write Errors

Errors related to writing or erasing flash are critical errors. These errors cause the printer to stop all processing and produce an LED code and a sequence of beeps. The LED code indicates the address of the segment where the error occurred in octal notation.

The octal digit changes every four beeps until four octal digits are output. Only four octal digits are output since blocks are 256 bytes in size and flash can be addressed with a total of 0x7ff blocks. The segment address output is the runtime address of the flash block and not the offset of the block within flash.

To obtain the block offset within the flash

• Subtract 0x800 from the address output to determine the block offset.

The printer suspends after the processing the error code. When the printer resumes, an error again and the printer suspends again. Reset the printer to correct the error. If a reset does not correct the error, have the printer checked by a qualified service technician.

Note: Flash write errors may be unrecoverable.

EEPROM Configuration Block Errors

Errors related to an invalid block (diagnostic block) produce 13 beeps, and then the printer suspends. It continues to produce this symptom until the configuration block error is corrected.

Configuration block errors may be caused by a flash write error or an incorrect printer configuration. Reset the printer to correct the error. If a reset does not correct the error, try reloading the printer control program using the Printer Configuration Utility or have the printer checked by a qualified service technician.

Troubleshooting Using the Printer Self-Test

Self Test Function Descriptions

The self-test performs the following functions.

- **Boot Block Program Verification**
  A CRC (Cyclic Redundancy Check) is performed on the boot block program. The calculated CRC is compared to the CRC embedded in the program module.

- **Control Program Verification**
  A CRC is performed on the control program, which is loaded into writable flash program memory. The calculated CRC is compared to the CRC embedded in the program module. The results of this test are printed on the self-test report.

- **Font Module Verification**
  A CRC is performed on the font modules, which are loaded into writable flash font memory. The calculated CRC is compared to the CRC embedded in the program module. Results are printed on the self-test report.

- **A2D Check**
  Current reading of the A2D sources are performed, and the results are printed on the self-test report.

- **Nonvolatile Diagnostic Memory Verification**
  A CRC is performed on the area of the nonvolatile diagnostic memory that has a CRC over it. Results are printed on the self-test report.

- **Nonvolatile Diagnostic Memory Update**
  The nonvolatile diagnostic memory is updated from the
  nonvolatile diagnostic memory data shadowed in memory.

Performing a Printer Self-Test

Initiating a Self-Test
- While the printer is idle or in Suspend mode, press the **Line Feed**
  and **Set Page** buttons simultaneously to start a self-test.

Terminating Self-Test
- Press the **Line Feed** and **Set Page** buttons simultaneously to
  manually terminate a self-test.

Running the Self-Test

Perform a self-test to verify printer functions, and provide reporting
of printer diagnostics. The self-test performs a series of internal
diagnostics and prints the results. When the self-test begins, the
beeper sounds for half a second and all LEDs turn on for half a
second.

A self-test is equivalent to a warm start. Both are performed when you
simultaneously press **Form Feed** and **Set Page** buttons on the control
panel for a few seconds. Release the buttons when the printer beeps
and all indicators are lit. If you press the buttons for too long, the self-
test will not happen and the printer will form-feed one page.

As the self-test progresses, the indicator lights change. Internal tests
are performed and a two page report is printed. The report provides
helpful information in diagnosing and troubleshooting problems.

Understanding the Self-Test Report

The self-test report is divided into sections. For sample printouts, see
"Sample First Page of the Self-Test" on page 87 and **"Sample
Second Page of the Self-Test" on page 88**. All other values are
informational only. Remember that these values are cleared after the
self-test.

- The printer model number is given on line 1 (first line). This
  identifies the printer type used, in this case the 6820.

- The 8-digit serial number of the printer is listed on line 4 under the "Serial#" heading on line 3. The serial number is also on the inside of the printer. In portable printers, raise the printer mechanism to look for the number on the inside back wall.

- Battery Voltage, (line 13)
  Indicates the input voltage sampled at the beginning of the self-test. The input range must be between 7.5 and 15 V. The input voltage must be greater than 10.5 V to charge the internal battery. At 7.5 V or less, the Low Batt LED comes on and the printer enters Sleep mode. At 10.5 V or less, the Low Batt comes on but the printer still prints.

- Auto Feed (line 16)
  Auto feed is a configurable item. Carriage Return (CR) means no auto linefeed. This is the most common setting for applications using NPCP CR+LF means a line feed will be added to each CR. This setting can produce double-spacing of reports. Set auto feed using the Printer Configuration utility see **"Using the Printer Configuration Utility" on page 20**.

- Interface Mode (line 17)
  Interface mode lists the interface protocol for the printer. The typical setting is NPCP. Others include DTR with no, odd, or even parity, and IrDA. Set Interface mode using the Printer Configuration utility see **"Using the Printer Configuration Utility" on page 20**.

- Bit Rate (line 18)
  Bit rate is commonly set to 19200 (19.2K) or 9600 bps. For more information, see **"Operating the Printer Configuration Utility" on page 23**.

- A2D History (lines 21 through 25)
  Shows the recorded history for voltage measurements and temperature measurements.

- Head Jam History (lines 26 through 29)
  Provides information on head jams. If the printer is having frequent head jams, these lines can assist in determining the problem.

Head Jam Information

Heading	Description
Home	Err indicates the home position LED sensor has failed.
Command	Indicates which printer command was executed when the head jammed.
Direction	Indicates which way the head was moving, left is toward the home position and right is away from the home position. Home position is at the extreme left, toward the green thumbwheel.
Speed	Indicates the acceleration speed of the printhead when the jam occurred.
Step	The acceleration step at the jam. 0 means no steps were taken, 15 means all steps were taken. 1-14 indicates the printer jammed during acceleration or deceleration.
Temp	The ambient temperature at the last head jam. The temperature is listed in Celsius.
Position	Position of carriage at the time of the jam in 1/720 in = 12 * step position. Divide the number by 12 to get the step position. There are 512 steps across the page. If it is jammed at position 0, check the printer mechanism alignment. If it is jamming in the middle, it is more likely a dirty ribbon or obstruction in the printhead's path.

- Head Dot Pattern (line 37)
  Is used to verify the individual dot wires. There should be nine dots. If some dots are missing, it could be a printhead failure or a circuit board failure.

- Error Log information appears on lines 38-43. This information is cleared after every self-test.

Error Log Information

Heading	Description
PE	Number of paper jams while feeding paper
HJ	Number of head jams while printhead is moving
12Vu	Number of 12 V under-voltage
12Vo	Number of 12 V over-voltage

Error Log Information (continued)

Heading	Description
24Vu	Number of 24 V under-voltage (head/motor voltage)
24Vo	Number of 24 V over-voltage
Home	Number of home detect errors (typically caused by paper scraps or circuit failures)
Temp	Unused
OverC	Number of head over-current errors (typically caused by a bad printhead)
HeadS	Number of head driver short errors (typically caused by circuit failures)
Fault	Number of paper feed motor over current errors (excess current in paper feed motor could indicate circuit failure)
ADErr	Number of A2D conversion failures
EEErr	Number of EEPROM write failures to diagnostic block
Dlink	Number of software memory errors (corruption in internal memory)
Llink	Number of software memory errors

Sample First Page of the Self-Test

Note: Lines 15–18 are factory default printer settings. Take note of these lines when reading the self-test report.

```
    -----------------------------------------------------------------------------
    ------------------------------------------------------- 1NP6820
 2 Copyright 1997, 1998, Intermec Technologies Corporation.  All Rights Reserved.
 3Serial#   MFG Date       Hardware             Check  Repairs  Svc Date
 412345678  yy/mm/dd  ddd-ddd-ddd/dddd (TOP)    GO/NG    00     yy/mm/dd
 5                    ddd-ddd-ddd/dddd (MLB)
 6                    ddd-ddd-ddd/dddd (PS)
 7                    ddd-ddd-ddd/dddd (IOB)
 8Revisions:..........0000000000303100
 9Bootblock:          NPBB6820.MOD  - Version  XX.XX  XXXX  XXXX  GO/NG
10Control Program:    npf16820.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
11Font Module:        nftxxxxx.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
12Font Module:        nftxxxxx.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
13Battery Voltage:    012.34        Low...../....High
14Total Pages:        123456
15Zero Font Style:    O
16Auto Feed:          CR
17Interface mode:     NPCP
18Bit Rate:           19200
19Cold Starts:        00024
20Warm Starts:        00050
```

```
21A2D History
22       Curr     Low      High     Min      Max      Error    Page    Count
2324v:  024.00   023.21   023.91   023.21   024.51   027.21   00401   00021
2412v:  012.55   010.91   013.51   010.90   014.50    8.71    00401   00021
25Temp:    023    -020      055     -021      060      000    00401   00021
26Head Jam History
27Total Head Jams:    00186
28Home  Command  Direction  Speed   Step   Temp   Position  Page
29      Print    Left       Const   010    -010   01440    12345
30NPCP History
31Disc   Addr     Parity   IFTS    Seq     CRC     Frame   Bind   IPLDU
3212345  12345   12345    12345   12345   12345   12345   12345  12345
33IRDA History
34      FramesOk    BroadCasts  CRC/TMO    DISCARD
35rx   1234567890  1234567890  0123456789  0000000000
36tx   1234567890  1234567890  0123456789  0000000000
37HEAD DOT PATTERN

38 Error Log
39PE    HJ    12Vu   12Vo   24Vu   24Vo   Home   Temp   OverC  HeadS  Fault  ADErr  EEErr
40Dlink  Llink
4112345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345
4212345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345
4312345 12345 12345 12345 12345 12345 12345 12345 12345 12345
```

Sample Second Page of the Self-Test

Page 2 of the self-test contains the print pattern used to diagnose printer mechanical behavior. The pattern continuously prints the ASCII characters between 33 and 126 decimal inclusive for the entire page, or until you cancel the print by pressing a button on the printer. An example of that rotating pattern is shown below.

```
!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuv
wxyz{|}~!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmn
opqrstuvwxyz{|}~!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdef
ghijklmnopqrstuvwxyz{|}~!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
```

Self-Test Failure

- For help, see **Miscellaneous Troubleshooting Tips**.

- Check the power source (internal battery, charge cable, or AC adaptor) for a possible power failure.

Miscellaneous Troubleshooting Tips

The following table lists actual printing problems, possible causes, and actions you should take to correct a problem.

Note: In paper jams or head jams, press the **Set Page** button to clear the printer before printing can resume.

Possible Printer Problems

Symptom	Test or Cause	Solution
Printer does not communicate with the mobile computer. Bluetooth unable to connect.	Incorrect protocol selection.	Check lines 17 and 18 on the self-test report for correct bit rate and protocol selection. Change protocol settings using the Printer Configuration Utility. For instructions see **"Using the Printer Configuration Utility" on page 20**.
Make sure you are in range (10 cm to 10 m).	Make sure your device is configured to be discoverable and/or connectable. For help, see **"Bluetooth Configuration Commands and Specifications" on page 115**.	Make sure the Bluetooth shutdown timer has not expired
Double-spacing on application reports but single-spacing on self-test.	Check line 16 on the self-test report. CR+LF indicates an incorrect configuration for NPCP.	For help, see **"Cleaning the Mask Spring" on page 103**.
Zero prints incorrectly (with or without slash).	Check line 15 on the self–test report for the Zero Font Style setting.	If incorrect, adjust the zero print option, see **"Cleaning the Mask Spring" on page 103**.
Does not print extended character set — missing font.	Check line 11 or 12 on the self–test report to see if the NFT0000.MOD file is listed after Font Module.	Use the 6820 Printer Tool Kit to reload the font file or send the printer in for hardware repair.
Printer emits 1 or 2 beeps or blinking green light is the only indicator.	Printer mechanism does not have adequate power for printing. The 12 V may be under or over voltage fault. (**Note:** Error lights do not flash if voltage is too high.)	Check the battery or power supply. If battery, recharge or replace. For help, see **"Installing the Internal Battery" on page 10**. If power supply, adjust supply voltage to 7.5 to 15 V. Check the printer's internal battery, if installed. Check the vehicle charge cable, for more information, see *6820 Printer Installation Instructions*.
Printer emits 2 sets of 3 beeps.	Printer out of paper.	Reload paper into printer mechanism. For help, see **"Loading the Paper Tray" on page 13**.

Possible Printer Problems (continued)

Symptom	Test or Cause	Solution
Printer works but some or all LEDs do not work.	Gray ribbon cable connecting control panel board to pivot frame assembly is loose.	Call Customer Support (800-755-5505) or send the printer in for repair.
Printer does not print.	No voltage.	Voltage too high or low. Check line 13 on the self–test report, under the Battery Voltage heading
No data input.	Adjust supply voltage to 7.5 to 15 V. Tighten computer connections.	No paper feed (paper jam or head jam)
Test: Pull paper toward roller. **Cause:** If paper is resistant:	Paper tray too full.	Torn paper perforation
Paper wrinkled, creased, moist, or perforations missing.	White ribbon cables obstructing paper.	Head Jams due to carriage alignment. Check line 29 on self-test report, under Position heading, for value.
	Ensure fewer than 200 3-ply sheets in the deep paper tray and fewer than 50 3-ply sheets in the shallow paper tray.	Remove torn paper, load and center new paper, readjust pinfeed holders.
Replace the paper.	Straighten the white ribbon cables.	If "0," realign mechanism in pivot tray.
No paper feed (paper jam or head jam).	Move the printhead manually from side to side.	Remove ribbon cartridge, move printhead. If smooth, ribbon is jammed. Remove ribbon cartridge, move printhead. If still resistant, mask spring is bent or damaged.

Possible Printer Problems (continued)

Symptom	Test or Cause	Solution
	Cause: printhead gap adjuster too tight. **Cause:** Paper scraps found in printer mechanism or around platen. Printer mechanism unlatched (unlocked). (portable, fixed mount printers).	Remove ribbon cartridge and turn knob. If ribbon resists, replace ribbon cartridge. For help, see **"Installing the Ribbon Cartridge" on page 11** . Replace the mask spring. For help, see **"Cleaning the Mask Spring" on page 103**. Set the head gap adjuster to the fifth notch away from the paper. For help, see **"Adjusting the Printhead Gap" on page 12**. If ribbon cartridge bumps against inside of printer, check white ribbon cable, home position sensor, and four screws. Remove any paper scraps. Latch (lock) the printer mechanism into place. Perform a self-test.

Understanding Diagnostic Information

Diagnostic information is stored in flash to support the hardware configuration, both at time of manufacture and in the field. This includes recording the initial configuration changes to hardware and software, and various environmental statistics helpful in determining why failures are occurring in the field. The flash is provided for storage of critical data that must remain in the unit after power to the unit is lost. The data in the flash is used for diagnostic information for a catastrophic failure, or over the phone with a customer.

Diagnostic information is updated and maintained by the printer. All diagnostic information is shadowed in RAM. At the end of every 50 forms, the flash information is updated from the RAM. The printer also updates the diagnostic information for nonrecoverable error, printer resets, printer self-test, and remote polling of diagnostic information.

Fields are stored with ID first, then length, then data. The details of the data and the length of the entire field, including ID and Length bytes, are shown in the Diagnostic Information table.

The amount of flash memory reserved for nonvolatile diagnostic memory is 16 K bytes. Printer self-test prints most of the information contained in the diagnostic memory for remote and end-user diagnostic access.

Diagnostic Information

Field Id	Length	Description	Stored as	Total Length
01	4	Serial Number	7 digit BCD set at MFG	39 bytes
	3	Date of Manufacture, yy/mm/dd	6 digit BCD set at MFG	
	7 7 7 7	Hardware Configuration ddd-ddd-ddd/ddd (top level P/N) ddd-ddd-ddd/ddd (control board) ddd-ddd-ddd/ddd (power supply) ddd-ddd-ddd/ddd (I/O board)	52 digit BCD set at MFG	
	2	CRC of preceding fields	2 byte binary set at MFG	
08	8	Hardware Revisions: ECNs. applied. 64 ECNs can record separately by number 1-64.	8 byte bit field	11 bytes
	1	Service Repairs: a two-digit field indicating number of times serviced	2 BCD digits	
	3	Date of last repair, yy/mm/dd	6 BCD digits	
09	2	Cold starts since MFG or last repair	binary digits	8 bytes
	2	Warm starts since last cold start	binary digits	
	2	Pages printed over life	binary digits	
10	2	Last high and low voltage extremes on 24 V input over last 50 reports. Extremes stored as 8-bit A2D conversions	2 bytes	11 bytes

Diagnostic Information (continued)

Field Id	Length	Description	Stored as	Total Length
	2	Voltage extreme history stores min/max 24 V A2D conversions over printer life	2 bytes	
	1	24 V voltage error. Voltages greater than 10% considered errors. A2D error count	1 byte	
	2	Form number at last voltage error	2 bytes	
	2	24 V error count	2 bytes	
20	2	Last high and low voltage extremes on 12 V input over last 50 reports. Extremes stored as 8-bit A2D conversions	2 bytes	11 bytes
	2	Voltage extreme stores min/max 12 V A2D conversions over printer life	2 bytes	
	1	12 V error. Voltages less than 10.5 V and greater than 14.5 V are considered errors. A2D value is recorded	1 byte	
	2	Page number at last 12 V error	2 bytes	
	2	12 V error count	2 bytes	
30	2	Temperature, maximum and minimum over last 50 reports. Set A2D value	2 bytes	11 bytes
	2	Temperature, min/max over printer life. Set A2D value	2 bytes	
	1	Temperature error. Last A2D conversion below -10 or above 60 °C recorded	1 byte	
	2	Page number at last temperature error	2 bytes	
	2	Total number of temperature errors	2 bytes	
40	2	Total number of head jams	2 bytes binary	11 bytes

Diagnostic Information (continued)

Field Id	Length	Description	Stored as	Total Length
	1	Command 0 = Stop 2 = Print 4 = Print/LF 6 = Seek 8 = Slow Seek 10 = Change Speed 12 = Feed 14 = Wait	bits 0-3	
		Speed 00 = Init 01 = Low 10 = High	bits 4-5	
		Direction 1 = Left 0 = Right	bit 6	
		Home Switch 0 = No Error 1 = High Error	bit 7	
	1	Acceleration or deceleration stop motor value when jam occurred	1 byte binary	
	1	Ambient temperature when had jam occurred. Set A2D value	1 byte	
	2	Form number where head jam occurred	2 bytes binary	
	2	Carriage position where head jam occurred	2 bytes binary in 1/720 in	
60	4	IrDA rxFramesOK – total frames received OK	4 bytes	46 bytes
	4	IrDA rxFrameCrcErr – total frames received with CRC error	4 bytes	
	4	IrDA rxTotalBytes – total bytes received OK	4 bytes	
	4	IrDA rxFramesDiscardBuf – total frames discarded due to no buffer space	4 bytes	
	4	IrDA rxBroadcastFrames – total broadcast frames received OK	4 bytes	

Diagnostic Information (continued)

Field Id	Length	Description	Stored as	Total Length
	4	IrDA rxFramesDiscardHwErr – total received frames discarded due to hardware error	4 bytes	
	4	IrDA txFramesOK – total frames transmitted OK	4 bytes	
	4	IrDA txTotalBytes – total bytes transmitted OK	4 bytes	
	4	IrDA txBroadcastFrames – total broadcast frames transmitted OK	4 bytes	
	4	IrDA txFramesNotTxTimeout – total frames not transmitted due to time out	4 bytes	
	4	IrDA txFramesNotTxHwErr – total frames not transmitted due to a hardware error	4 bytes	
70	2	Paper out count	2 bytes	74 bytes
	2	Head jam count	2 bytes	
	2	12 V low count	2 bytes	
	2	12 V high count	2 bytes	
	2	24 V low count	2 bytes	
	2	24 V high count	2 bytes	
	2	Home switch error count	2 bytes	
	2	Unused	2 bytes	
	2	Over current error count	2 bytes	
	2	Head short error count	2 bytes	
	2	Paper fault error count	2 bytes	
	2	A2D conv. error count	2 bytes	
	2	EEPROM write error count	2 bytes	
	2	Double link error count	2 bytes	
	2	Lost link error count	2 bytes	
	2	Out of buffers error count	2 bytes	
	2	Unused	20 * 2 bytes	

Cable Configurations

This section shows common cable configurations between a mobile computer or a dock and the printer.

Mobile Computer   Wall Mount Printer or
                                                                   Remote Mount Terminal Holder

Signal Name	Pin #	Pin #	Signal Name
		shield	
Chassis Ground	shell ———— 1		NC (No Connection)
Charge Input	8 ———— 9		HHC_CHARGE
SG (Signal Ground)	9 ———— 7		GND
DSR (Data Set Ready)	7 ———— 6		DTR
DTR (Data Terminal Ready)	2 ———— 20		NC
CTS (Clear To Send)	6 ———— 5		RTS
RTS (Ready To Send)	3 ———— 4		CTS
RXD (Receive Data)	5 ———— 3		TXD
TXD (Transmit Data)	4 ———— 2		RXD
Dock_A/B_SW	NC ———— 12		Term A/B
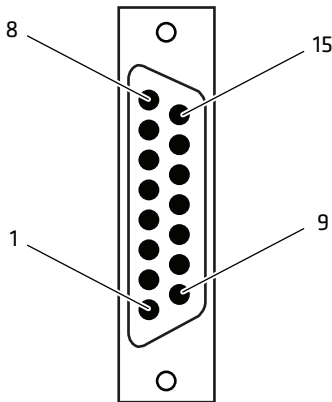
15-Pin D-sub Male
15-Pin to 25-Pin Cable (P/N 216-605-1XX)
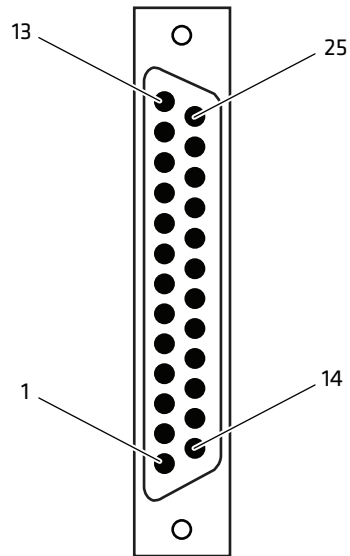
25-Pin D-sub Male

15-Pin to 25-Pin Cable (P/N 216-605-xxx)

PC

Wall Mount Printer

Signal Name	Pin #	Pin #	Signal Name
DTR (Data Terminal Ready)*	20 ——— 20		NC (No Connection)
RC (Receive Carrier)	17 ——— 17		NC
TC (Transmit Carrier)	15 ——— 15		NC
DCD (Data Carrier Detect)	8 ——— 8		NC
SG (Signal Ground)	7 ——— 7		GND
DSR (Data Set Ready)*	6 ——— 6		DTR
CTS (Clear to Send)	5 ——— 5		RTS
RTS (Ready to Send)	4 ——— 4		CTS
RXD (Receive Data)	3 ——— 3		TXD
TXD (Transmit Data)	2 ——— 2		RXD

* Signals are not available on the 6100 Dock
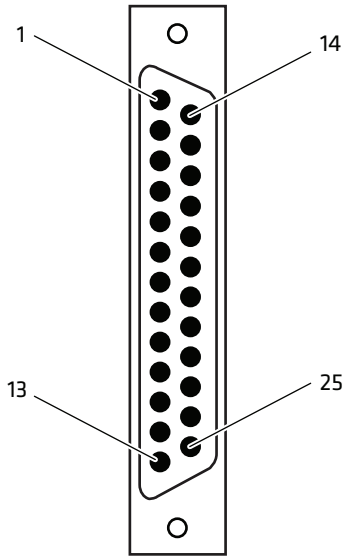
25-Pin D-sub Male
25-Pin to 25-Pin Cable (P/N 216-771-XXX)
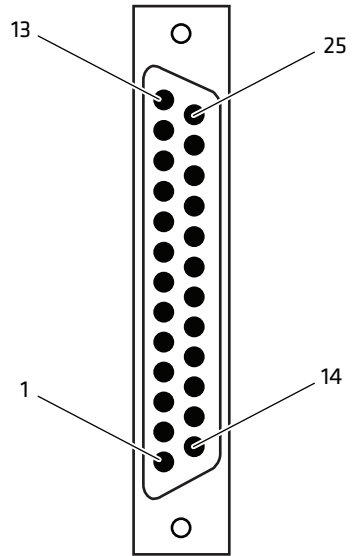
25-Pin D-sub Male

25-Pin to 25-Pin Cable (P/N 216-771-xxx)

PC   Printer

Signal Name	Pin #	Pin #	Signal Name
TXD (Transmit Data)	3 ———— 4		TXD
RXD (Receive Data)	2 ———— 5		RXD
RTS (Ready to Send)	7 ———— 3		RTS
CTS (Clear to Send)	8 ———— 6		CTS
DSR (Data Set Ready)	6 ———— 7		DSR
SG (Signal Ground)	5 ———— 9		SG

shield

Chassis Ground   shell ——— shell   Chassis Ground
. . . .   8   Terminal Charge out to computer
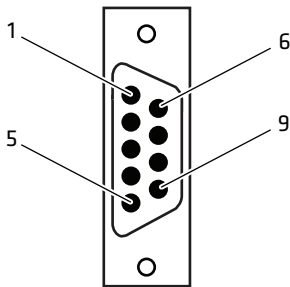
9-Pin D-sub Female
9-Pin to 15-Pin Cable (P/N 226-016-XXX)
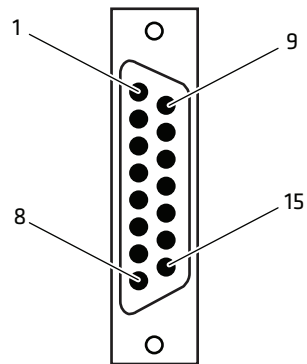
15-Pin D-sub Female

9-Pin to 15-Pin Cable (P/N 226-016-xxx)

Dock   Printer w/6210 Terminal Holder

Signal Name	Pin #	Pin #	Signal Name
TXD (Transmit Data)	2 ——————— 4		TXD
DTR (Data Terminal Ready)	20 ——————— 2		DTR
RTS (Ready to Send)	4 ——————— 3		RTS
RXD (Receive Data)	3 ——————— 5		RXD
CTS (Clear to Send)	5 ——————— 6		CTS
DSR (Data Set Ready)	6 ——————— 7		DSR
SG (Signal Ground)	7 ——————— 9		SG

open ——— shield ——— shell
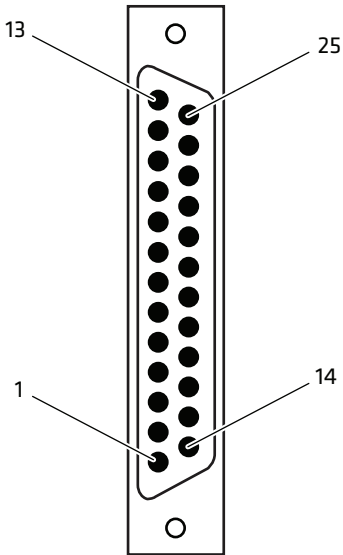
25-Pin D-sub Male
25-Pin to 15-Pin Cable (P/N 226-162-XXX)
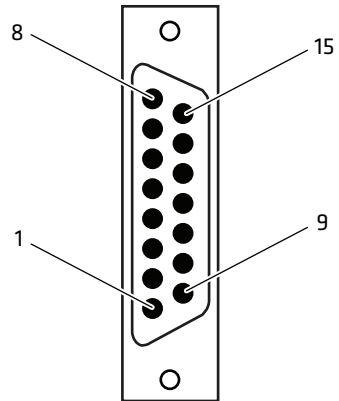
15-Pin D-sub Female

25-Pin to 15-Pin Cable (P/N 226-162-xxx)

PC   Printer

Pin #	Pin #
7 ——————— 6	
5 ——————— 5	
3 ——————— 3	
2 ——————— 2	
8 ——————— 1	
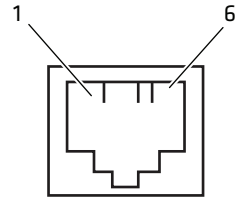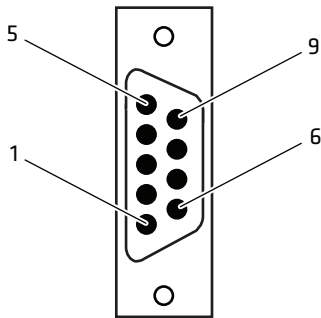
9-Pin D-sub Female
Data Communications Cable (P/N 226-270-XXX)

RJ-11 Jack

Data Communications Cable (P/N 226-270-xxx)

The printer has a 25-pin connector option with the following pinout designations and signal mnemonics:

Printer Communications Connector

15-Pin D–Sub	25–Pin D–Sub	Signal Name	Type	I/O	Description
1	NC	NC	– – –	– – –	NC (No Connection)
2	20	DSR (Data Set Ready)	RS-232	IN	Printer DSR
3	4	CTS (Clear To Send)	RS-232	IN	Wake up
4	2	RXD (Receive Data)	RS-232	IN	Printer RxD
5	3	TXD (Transmit Data)	RS-232	OUT	Printer TxD
6	5	RTS (Ready To Send)	RS-232	OUT	Printer RTS
7	6	DTR (Data Terminal Ready)	RS-232	OUT	Printer DTR
8	9	HHC_CHARGE	POWER	OUT	11-13 V, 2 A maximum
9	7	GND	POWER		SG (Signal Ground)

Cleaning the Printer

Periodic cleaning helps maintain the appearance and reliability of the printer. When cleaning the printer, inspect both the outside and the inside for signs of damage or wear.

Glass cleaners containing ammonia will cause permanent damage to the printer cover.

Do not use abrasives or solvents (acetone, ketone, toluene, or xylene) to clean any part of the printer or permanent damage to the printer will occur.

Note: Micro Clean II (P/N 901-438-xxx) is the only cleaner recommended for the printer case. Other cleaners can damage the printer case. Contact Intermec Inside Sales at 1-800-255-6292 to purchase Micro Clean II.

Note: Guide Shaft Cleaner is recommended for cleaning your 80-column printer guide shafts. Cleaning the printer guide shaft can reduce the number of head jams caused by dirt and buildup. Contact Intermec Inside Sales at 1-800-255-6292 to purchase Guide Shaft Cleaner.

Cleaning the Outside of the Case

Do not pour liquid cleaners directly on the printer case. Instead, dampen a soft, lint-free cloth with a quality cleaner and clean the exterior surfaces with this cloth. Do not use solvent solutions. Inspect the DC power jack, all cables, and the remote terminal holder or vehicle dock for damage.

Cleaning the Inside the Case

Let the printer cool before you clean the inside of the printer or you may burn your fingers.

Open the printer cover and inspect the ribbon cartridge and all visible moving parts on the printer mechanism for signs of wear or damage.
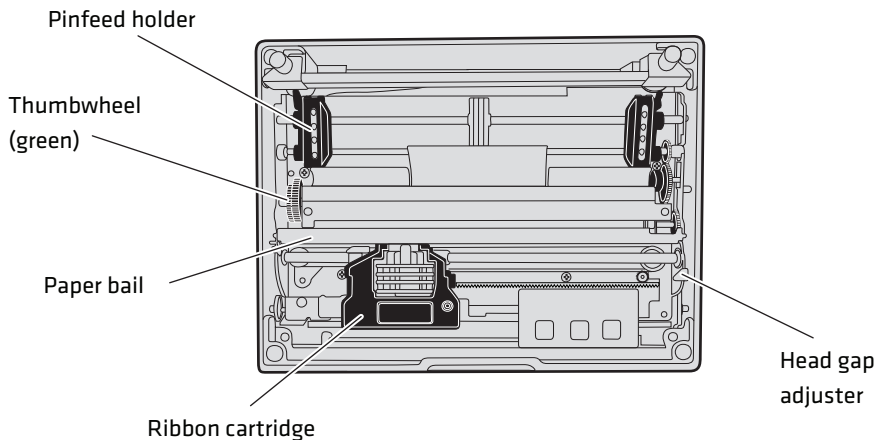
Moving Parts in the Printer Mechanism

Use a low-pressure, dry air source, such as canned air, or a vacuum, to remove accumulated paper dust from the printer mechanism.

Changing the Ribbon Cartridge

The printer ribbon contains a special lubricant to ensure that the fine dot wires inside the printhead receive adequate lubrication. Replace the ribbon frequently to prolong the life of the printhead. The printer requires no additional lubrication.

To change the ribbon cartridge

1 Move the printhead mechanism to an open area.

2 Squeeze the ribbon cartridge locking tabs (on the side of the cartridge) against the ribbon cartridge.

3 Lift the ribbon cartridge to remove the ribbon from the printhead. Make sure the ribbon does not catch or get sticky.

4 Lift the ribbon cartridge out of the printer.

Cleaning the Mask Spring

Check the mask spring behind the printhead. If the mask spring appears to be in good condition, install a new ribbon cartridge. If the mask spring is dirty, clean it as described below.

To clean the mask spring

1 Unlatch the printhead locking tabs to release the printhead, lift the printhead aside, then lift up the paper bail. Do not detach the printhead unit.

Caution

Never use a sharp object to clean between the printhead and the platen (rubber roller) or you may damage the mask spring and printhead.

Print head
locking tabs

Print head
lifted aside

Mask spring

Raised
paper bail
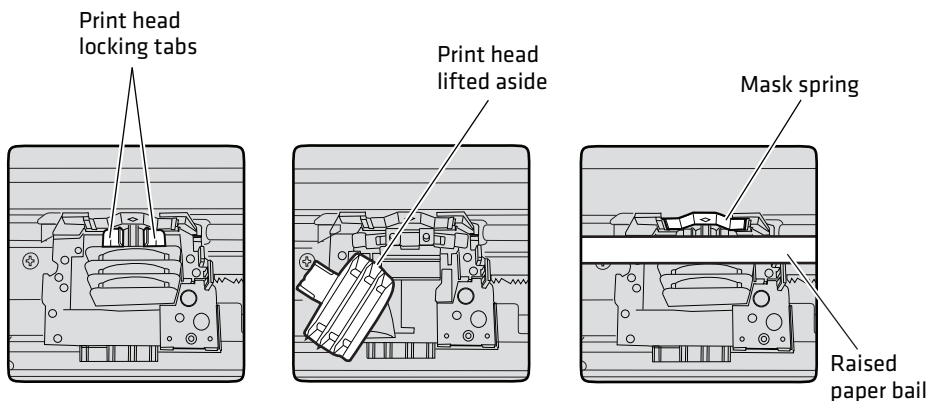
2 Remove the clear plastic paper guide that seats the mask spring, if necessary. Use your fingernails to loosen the base of the paper guide, then pull the paper guide straight up from the printer mechanism.

3 Remove the metal mask spring from the paper guide and clean with a quality cleaner like rubbing alcohol. Replace if damaged.

4 Insert the mask spring in the paper guide and install the paper guide into the printer.

5 Close the paper bail, reinsert the printhead, latch the two printhead locking tabs, and install the ribbon.

A
Specifications and Default Settings

This appendix provides physical specifications for the 6820 printer models as well as specifications for the media used with the printers.

Specifications

Print Speed

Print Speed	230 cps (print font used does not affect the print speed)

Weight

Fixed Mount Printers	6.55 kg (14.41 lbs)
Portable Printers	
with 700 Series or CK61 holder	5.67 kg (12.25 lbs)
CN3 series holder	14.38 oz (0.90 lbs)
CN70/CN70e holder	13.24 oz (0.83 lbs)
Mounting plate	1.93 kg (4.25 lbs)
Flat paper tray	2.45 kg (5.40 lbs)
Compact paper tray	2.05 kg (4.50 lbs)

Temperature

DC Operating	-20 °C to 60 °C (-4 °F to 140 °F)
AC Operating	-20 °C to 45 °C (-4 °F to 113 °F)
Storage	-30 °C to 70 °C (-22 °F to 158 °F)

Humidity

Operating	10 to 85% noncondensing
Storage	5 to 95% noncondensing

Altitude

Operating	-100 to 5000 m
Storage	15,000 m

Electrical

Voltage	13.8 VDC (nominal)
Current	30 mA (idle, sleep mode not charging batteries)
	3.35 A (average while printing)
	450 mA (charging internal battery)
	Up to 1.5 A (charging computer battery)

Vibration

Vibration	12 g RMS for 4 hours

ESD

Noncontact	15 kV
Contact	8 kV

Battery

Shelf Life	1 year at 25 °C (77 °F)
Power	12 V sealed lead-acid
	2.3 Ah

Note: The battery goes dead in two weeks or less when connected to the printer and with no external charge source.

Note: A printer and a computer, using the supplied serial cable, can operate up to 9 m (30 ft) apart.

Printer Dimensions

Listed below are the dimensions of the fixed mount and portable printers.

Fixed Mount Printer

The base of the fixed mount printer is 32.5 cm (12.75 in) wide by 35.5 cm (14.0 in) front to back. The upper portion varies according to the configurations shown in the following table.

Fixed Mount Printer Dimensions

Configuration (with deep paper tray)	Width	Length	Depth
with 700 Series or CK61 Holder Side Mount	47.0 cm (18.5 in)	36.8 cm (14.5 in)	20.3 cm (8.0 in)
with 700 Series or CK61 Holder Top Mount	36.8 cm (14.5 in)	38.1 cm (15 in)	20.3 cm (8.0 in)
with CN3 Series, CN70, or CN70e Holder Side Mount	47.0 cm (18.5 in)	36.8 cm (14.5 in)	20.3 cm (8.0 in)

Fixed Mount Printer Dimensions (continued)

Configuration (with deep paper tray)	Width	Length	Depth
with CN3 Series, CN70, or CN70e Holder Top Mount	36.8 cm (14.5 in)	38.1 cm (15 in)	20.3 cm (8.0 in)

Portable Printer

The portable printer may come with a handle, an AC foot, or with a terminal holder top mount.

Portable Printer Dimensions

Configuration	Width	Length	Depth
with handle, 700 Series, or CK61 Holder Top Mount, and Deep Paper Tray	38.1 cm (15.0 in)	41.9 cm (16.5 in)	20.3 cm (8.0 in)
with handle, 700 Series, or CK61 Holder Top Mount or Fill Plate, and Shallow Paper Tray	38.1 cm (15.0 in)	41.9 cm (16.5 in)	13.0 cm (5.1 in)
with handle, CN3 Series, CN70, or CN70e, Holder Top Mount, and Deep Paper Tray	38.1 cm (15.0 in)	41.9 cm (16.5 in)	20.3 cm (8.0 in)
with handle, CN3 Series, CN70, or CN70e, Holder Top Mount or Fill Plate, and Shallow Paper Tray	38.1 cm (15.0 in)	41.9 cm (16.5 in)	13.0 cm (5.1 in)

Media Specifications

⚠️ **Caution**

Using paper that matches the following specifications ensures optimum 6820 performance. Variation from these specifications, use of aged paper, or use of paper exposed to elements such as dirt or humidity may cause printing problems.

The printer works with 1-3 ply carbonless paper that is single-edge glued and designed for sprocket feed. Standard paper size is 8.5 x 11 inch or 241 x 305 mm international (8.5 x 12 in). Use 3-ply forms up to a maximum of 0.23 mm (0.009 in) thick.

A soft, flexible, rubber type cement applied to one perforation strip only is preferred. The paper should wrap around a 1 1/4 in diameter roll without curl or wrinkle.

Material Breakdown

The following tables show the material broken down per ply.

14# CBF (Carbonless Back and Front)

	Target	Under	Over
Basis Weight	14 lb	13.3 lb	14.7 lb
Caliper	2.9	2.6	3.2
Moisture	5.0	4.0	6.0
Smoothness (RS)	165	110	230
Smoothness (CB)	270	220	320
Brightness (Wht)	88	86	90
Colors available: White, Canary, Pink, Goldenrod, Blue, Green

15# CF (Carbonless Front)

	Target	Under	Over
Basis Weight	15 lb	14.43 lb	15.8 lb
Caliper	3.0	2.5	3.2
Moisture	5.0	4.0	6.0
Smoothness (RS)	140	100	180
Smoothness (CB)	140	100	180
Brightness (Wht)	85	84	86
Colors available: White, Canary, Pink, Goldenrod, Blue, Green

16# CB (Carbonless Back)

	Target	Under	Over
Basis Weight	16 lb	15.2 lb	16.8 lb
Caliper	3.3	2.8	3.8
Moisture	5.7	4.2	6.7
Smoothness (RS)	180	120	270
Smoothness (CB)	270	220	320
Brightness (Wht)	86	84	88
Opacity (Wht)	81	78.5	82

16# CB (Carbonless Back)

	Target	Under	Over
Colors available: White, Canary, Pink, Goldenrod, Blue, Green			

20# OCR Laser Bond

	Target	Under	Over
Basis Weight	20 lb	15.2 lb	16.8 lb
Caliper	4.0	3.8	4.2
Moisture	3.8	4.7	5.0
Smoothness	140	100	170
Brightness (Wht)	94	82	N/A
Opacity (Wht)	85	84	N/A

Caliper Breakdown

The following table shows the caliper of forms broken down by ply:

Calliper Breakdown

	Target	Maximum
1-Ply (20 lb)	4.0	4.2
2-Ply (15 lb and 16 lb)	6.3	7.0
3-Ply (14 lb, 15 lb, and 16 lb)	9.2	10.2

Understanding the Fanfold Paper Page Layout

The following illustration shows the printable area of the lower section of a page of fanfold paper and the upper section of the next page. The Assured Print Area is the best area to use for printing.
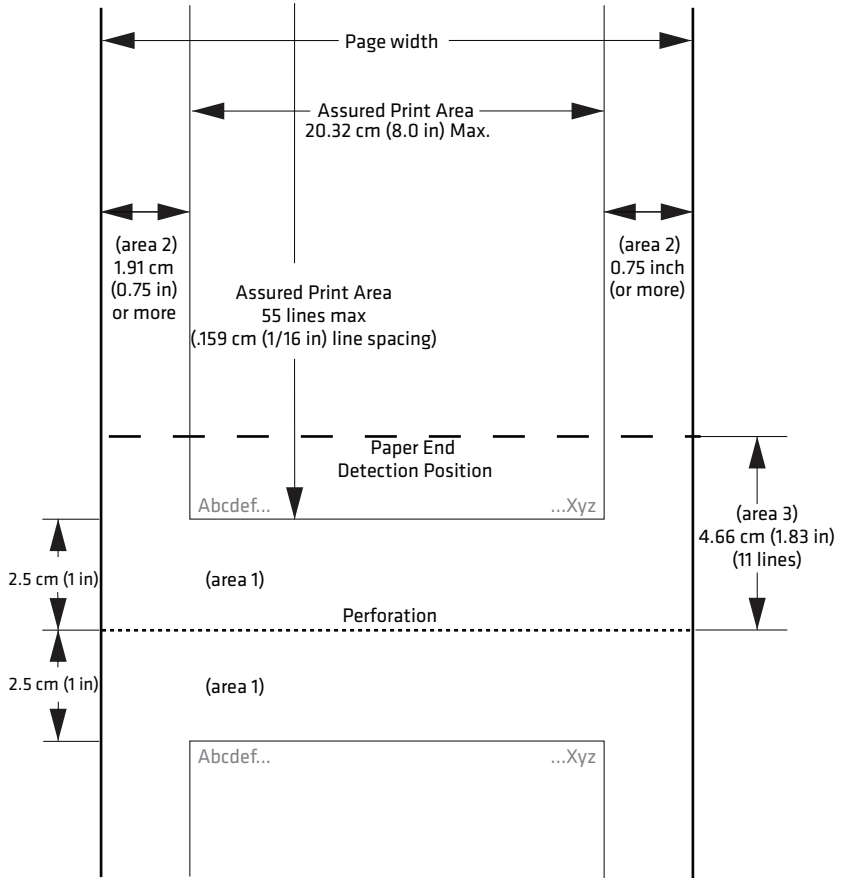
Printable Area of Fanfold Page

You should leave a 1 inch margin at both the top and the bottom of the page. This provides for a margin of six lines at 1/6 inch line spacing. Even though printing in Area 1 (before or after the perforation) may be possible, you should keep in mind that paper feed precision is reliable only within the Assured Print Area.

- The top and bottom margins are represented by Area 1, as shown in the previous illustration. The top margin is defined as the distance between the top edge of the paper and the first row of printed characters. The bottom margin is defined as the distance

between the last row of printed characters and the bottom edge of the paper.

- There is a possibility that printing can start within one line below the perforation and printing could continue beyond the Assured Print Area, however paper feed precision is only reliable with top and bottom margins of approximately one inch. Basically, you should consider there are only 55 lines available for reliable printing.

- The left and right margins are represented by Area 2. For reliable printing, use a margin of at least 0.75 in for the left and right margins.

The Paper End Detection line indicates the point where the Paper Out sensor detects the bottom edge of the paper.

Area 3 represents the distance between the Paper End Detection position and the bottom edge of the page.

Once the last page of the fanfold paper stack is in the printer, and the printhead has advanced past this Paper End Detection line, printing is no longer reliable.

When the bottom end of the last page has advanced through the printer, past the spring plate along the front of the platen, the paper should not reverse back through the printer, because the printer could jam and cause paper feed problems.

Factory-Installed Printer Defaults

Factory Installed Printer Defaults

Function	Default Value
Carriage position	At left margin
Character set	Normal (not user defined)
Code page	0
Codes 128-255	Disabled
Condensed (compressed)	Disabled
Double-Strike	Disabled
Double-Wide	Disabled

Factory Installed Printer Defaults (continued)

Function	Default Value
Emphasized	Disabled
Graphics mode	Not selected
Half-Speed printing	Disabled
Intercharacter space	Zero (0)
International character sets	Disabled
Italic	Disabled
Justification	Left justification
Keyboard, printer	Enabled
Language	USA
Line Spacing	1/6 inch
Margin, left	0
Margin, right	80
MSB control	Disabled
NLQ	Disabled
Page length	11 inch (66 lines with Pica pitch)
Paper end sensor	Enabled
Pitch	Pica (10 characters per inch)
Power off sleep timer	10 seconds
Printer Code Area Expansion	Disabled
Printing direction	Top-down, bidirectional
Redefinition of graphic modes	Disabled
Skip over perforation	Disabled
Subscript/Superscript	Disabled
Tabs, horizontal	Set to default tabs (every 8 column)
Tabs, vertical	1 line feed each tab, channel = 0
Top of form	Set to current line
Underline	Disabled
Unidirectional printing	Disabled (bidirectional)
User defined character set	Removed

The settings in the previous table are installed in the printer at the factory. To restore the printer to these defaults, see **"Using the Reset Button" on page 5** for instructions.

The default settings listed below can be restored to the printer, as described in **"Using the Printer Configuration Utility" on page 20**.

Printer Default Settings

Function	Default Value
Zero Print option	Zeros are printed with a slash
Auto Feed configuration	CR (carriage return added at end of line without line feed)
Protocol	NPCP (NORAND Portable Communications Protocol)
Parity	N/A (for NPCP)
Bit Rate	19.2 K

B

Bluetooth Configuration Commands and Specifications

Configuration of the Bluetooth radio and software is accomplished using the Bluetooth Configuration Commands listed in this appendix and the Bluetooth Configuration Utility which is available from Intermec Product Support.

Using Configuration Commands

You can enter all printable characters directly with the keyboard. Any non-printable characters are entered in binary data format.

Numbers are in decimal format, except numbers with:

- an h suffix are in hexadecimal.

- a "0x" prefix are in hexadecimal.

- a "b" suffix are in binary.

Binary data format is any non seven-bit ASCII data to transmit to the module is encoded in the Internet percent notation. Any hex byte to transmit is preceded by the "%" sign and encoded in hex ASCII. To send the value 0xF5, the "%F5" bytes are transmitted. The "%" character is always transmitted as "%25". A Bluetooth address could transmit as "%00%E0%03%45%F4%6D".

Generic format:

```
<command character><command type><command payload><CR>
<command character> is one character from the set: [A-Z]
<command type> is one character for the set: [0-9]
<command payload> is variable in length.
<CR> is the command terminator.
```

The `<command payload>` is formed from printable ASCII characters from the code range 0x20 to 0x7E.

Codes outside of this range are escaped using the percent (%) character followed by two hexadecimal digits.

The percent character is always represented by the three characters %25.

The command terminator is character code 0x13 (carriage return), or character code 0x10 (line feed), or character codes 0x13, 0x10 (carriage return, line feed).

An example command to set the friendly name to "Len's 100% serial module":

```
F0Len's 100%25 serial module<CR>
```

Character codes outside of the range of 0x20 to 0x7E are ignored.

When using percent (%) to form hexadecimal character codes there must be exactly two hex digits using characters: [0-9, A-F, a-f]. Characters outside of this range cause the command to fail.

- Commands that fail return the four character sequence `NAK<CR>`

- Commands that are accepted return the four character sequence `ACK<CR>`

- Commands that return payload data use the format:

```
<command character><command type><coCK61mmand
payload><CR>
<command character> is one character from the set: [a-z]
<command type> is one character for the set: [0-9]
<command payload> is variable in length.
<CR> is the command terminator.
```

The command character is the lower case version of the local host command.

Operating Modes

The module interface has two modes:

- **Bluetooth Link Active State**
  In this case the Serial Interface looks like a raw serial port (TxD, RxD, CTS, etc. and GND). There is no intelligence in the Bluetooth module from the serial interface perspective. This mode does not support the command and control modes described below.

- **Bluetooth Link Inactive State**
  This mode exists when a Bluetooth link does not exist. In this case, the serial interface looks like a serial port that supports a number of command and control modes.

On reset, the unit comes up in Bluetooth Link Inactive state. After the first Bluetooth connection, the unit goes into Bluetooth Link Active state. It stays in this state until the link is lost because the Master shuts it down or there is an out-of-range condition, it then returns to the Bluetooth Link Inactive state.

Command and Control Modes

Query Mode Commands

Command	Function
?<CR>	Read ACK
?F0<CR>	Read friendly name
?L<CR>	Read security mode
?C0<CR>	Read connectable mode
?C1<CR>	Read page scan timing
?D0<CR>	Read discoverable mode
?D1<CR>	Read inquiry scan timing
?S1<CR>	Read class of device
?S2<CR>	Read service name
?S4<CR>	Read PIN code
?T0<CR>	Read shutdown timeout in minutes
?B0<CR>	Read Bluetooth addresses of all the paired devices

Example Commands

Command	Function
"?<CR>"	"ACK<CR>"
"?F0<CR>"	"f0MyFriendlyName<CR>"
"?L<CR>"	"10<CR>" Turn off Encryption, Authentication, and Exclusion "11<CR>" Authentication "12<CR>" Encryption and Authentication "13<CR>" Encryption, Authentication, and Exclusive
"?C0<CR>"	"c0ON<CR>"
"?C1<CR>"	"c11024,512<CR>"
"?D0<CR>"	"d0ON<CR>"
"?D1<CR>"	"d11024,512<CR>"
"?S1<CR>"	"s1001F00<CR>"
"?S2<CR>"	"s2MyServiceName<CR>"
"?S4<CR>"	"s4MyPinCode<CR>"

Example Commands (continued)

Command	Function
"?T0<CR>"	"t0Shutdown Timer = 5 minutes<CR>"
"?B0<CR>"	"b0No Devices PairedCR>"

Note: These commands are only available over the serial link, not over the air and are not available when the device is in the Bluetooth Link Active State.

Set Local Bluetooth Device Name

Syntax: F0<Device Friendly Name><CR>

Description: "Device Name" — String up to 254 bytes long

Default: "6820-DDEEFF" where DDEEFF is from the (AABBCCDDEEFF) Bluetooth device address

Example: "F01Len's 100%25 serial module<CR>" sets the name to "Len's 100% serial module."

Set Class of Device/Service Field

Syntax: S1< Class of Device/Service field >

Description: The Class of Device/Service (CoD) field is a 24-bit field defined in the Bluetooth Assigned Numbers document. This field is sent in a HEX ASCII format, most significant byte first.

Example: "S1001F00<CR>" is a common Class of Device value for a basic serial device.

Set Service Name

Syntax: S2<Service Name>

Description: Sets the service friendly name to send to the remote Bluetooth device in response to a service discovery request. The length of the service name is limited to 32 bytes.

Definition: Profile Name — text name entered into the SDP record for the serial port profile.

Default: "Wireless Printer"

Example: "S3Acme Printer<CR>"

Connectable On/Off

Syntax: C0 <ON|OFF><CR>

Description: Sets the device into "connectable" mode

Example: "C0OFF<CR>" — Become non-connectable
"C0ON<CR>" — Become connectable

Specify Page Scan Timing

Syntax: C1<Page_Scan_Interval>,<Page_Scan_Window><CR>

Description: Sets the Page Scan timing parameters

Default: 4096,18

Example: "C11024,512<CR>"

Note: To enable scanning, the values for Interval and Window must be in the range of 18 to 4096. The Window value must be less than the Interval value. Both values must be zero to disable scanning.

Note: Modifying Page Scan Timing can improve connection times, but may adversely affect battery performance.

Enable Discoverable

Syntax: D0 <ON|OFF><CR>

Description: Sets the device into "discoverable" mode

Example: "D0OFF<CR>" — Become non-discoverable
"D0ON<CR>" — Become discoverable

Specify Inquiry Scan Timing

Syntax: D1<Inquiry_Scan_Interval>,< Inquiry_Scan_Window><CR>

Description: Sets the Inquiry Scan timing parameters

Default: 4096,18

Example: "D11024,512<CR>"

Set Encryption/Authentication Pin Code

Syntax: S4<PIN code>

Description: PIN Code; can be NULL and as long as 16 characters

Default: "S4%00" NULL PIN code

Example: "S4MyPinCode <CR>"

Manage Security Modes

This command controls the security access mode and device pairing.

The modes available are:

• L0 Disable encryption, authentication and exclusion

• L1 Enable authentication

• L2 Enable encryption and authentication

• L3 Enable encryption, authentication and exclusive

Mode L0 allows any remote device to connect.

Mode L1 require the remote device to be authenticated by a PIN request.

The PIN code for the module is set to a user–specified value with the S4 command. Currently the default PIN is the NULL string.

Mode L2 adds encryption to the Bluetooth link.

Mode L3 adds exclusive connection to one specific Bluetooth device.

In this mode only connection requests from the initial device are allowed. Connections from other devices are rejected even if they supply the correct PIN code.

Device pairing and bonding are associated with this command and works as follows:

After an L command is executed the current device pairing and bonding is deleted. The next device to connect becomes paired and bonded to the module.

In Modes L1 and L2, other devices are allowed to connect but only the first device to connect is paired and bonded. Other devices are always required to supply a PIN code to complete the connection.

In Mode L3, only one device is allowed to connect. This device is paired and bonded and needs to supply the PIN code only on the initial connection.

Note: Some of the Bluetooth user interfaces cannot supply a NULL string as a PIN code. Use the S4 command to specify a PIN code that is not NULL.

Read Module Version

Syntax: V0<CR>

Description: Displays the firmware build version currently running

Example: "V0<CR>" Returns: "v1yyyymmddHHMM<CR>"

Note: This command responds with the requested data, only not the "ACK<CR>".

Read Local Device Address

Syntax: V1<CR>

Description: Displays the local device address

Example 1: "v1%xx%xx%xx%xx%xx<CR>"

Note: This command responds with the requested data, only not the "ACK<CR>".

Example 2: Sent: "V1<CR>"
Received: "v1%00%2C%C6%03%45%39"

Set Shutdown Timing

Syntax: T0<Time in Minutes><CR>

Description: "Time" – Integer value – 0 implies never expire the timer

Default: 120

Range: 0 to 270 minutes

Example: "T0120<CR>" This sets the shutdown timer to 120 minutes.

Clear Link Key Table

Syntax: B0<CLR><CR>

Description: Clear Pair or Bonding command cleans up all of the link key and Bluetooth address combination PSKEYs.

Default: None

Example: "B0CLR<CR>" Clears all saved link keys.

Understanding Adapter States or Modes

The Bluetooth adapter connects to an internal serial port of the 6820, providing serial print data over a transparent Bluetooth link, running a Serial Port Profile (SPP).

Printing is primarily accomplished over a Bluetooth link using the SPP protocol with an Intermec mobile computer. If the relevant printer configuration allows it, a mobile computer in a terminal holder charges normally.

The Bluetooth adapter allows for four states or modes to be available. Each state is dependent upon either the pin states on the terminal holder connector or the programming connector on the adapter.

Bluetooth Adapter States or Modes

State	State/mode	HHC_A/B pin	HHC_DTR pin	Comments
1	Bluetooth printing	0	0	Bluetooth printing/Bluetooth self-test
2	Pass–through printing	0	1	Printing from 700 Series or CK61s allowed to pass through the Bluetooth adapter
3	Bluetooth reconfiguration	1	0	Reconfiguring Bluetooth module via 700 Series or CK61s
4	Bluetooth programming cabled	X	X	Programming Bluetooth module via programming cable

- State 1 - In addition to allowing normal Bluetooth printing, this state also allows for a 700 Series or CK61 in the terminal holder to perform a Bluetooth self-test.

- State 2 is a Transparent Pass Through mode available for all 700 Series and CK61 mobile computers. In this mode, the Bluetooth module is shut down and does not communicate.

- State 3 (Bluetooth reconfiguring using a 700 Color (730, 740, 741, 750, 751, 760, 761 or CK61). This state is unavailable with a 700 Monochrome (705, 710, 720) because the A/B pin is unavailable.

- State 4 allows for programming the Bluetooth module via its SPI pins. This state is also used for manufacturing tests. To be in this

state, the 700 Series or CK61 must not have an open terminal holder COM port and the specially designed programming adapter must be engaged.

The interfaces on the Bluetooth adapter that allow for the different modes are detailed below:

700 Series or CK61 to 6820 Pass Through

Note: Pass through printing requires shutting down the Bluetooth portion of the adapter. To reenable Bluetooth functionality after you finish pass through printing, press a button on the control panel to wake the printer.

When DTR on the 700 Series or CK61 is set, the adapter board automatically opens a path between the 700 Series of CK61 and the 6820 Transition/DC Board and powers down the Bluetooth module. Testing the DSR pin to reflect DTR allows the mobile computer to differentiate between a Bluetooth-equipped terminal holder and a non-Bluetooth equipped terminal holder.

Radio Power On/Off Mechanism

The Bluetooth adapter, including the Bluetooth radio shuts down after a configurable time (default is two hours of idle time). To wake the Bluetooth adapter, the 6820 is powered on by any button push on the printer control panel.

Note: The adapter complies with Bluetooth 1.1 specification, including bonding for authentication and enabling encryption.

Persistent Storage

The following settings do not reset after you cold boot on the printer:

- Bluetooth Bonding Enable/Disable
- Bluetooth Encryption Enable/Disable
- Bluetooth Passkey
- Bluetooth Bonding List (Link Keys)
- Bluetooth Device Name
- Bluetooth Class of Device
- Discoverable setting
- Connectable setting
- Radio Shutdown Timer Timeout (default two hours of idle time)

System Behavior/Software Considerations

- Discoverability — The default mode is discoverable.
  When configured to be discoverable, the adapter is discoverable at all times, except when:
  - an active Bluetooth connection exists.
  - you have just completed a "pass-through printing" print job.
  - the shutdown time has elapsed (default shutdown time is two hours).
- Connectability — The default mode is connectable.
  When configured to be connectable, the printer is connectable at all times, except when:
  - an active Bluetooth connection exists.
  - you have just completed a "pass-through printing" print job.
  - the shutdown time has elapsed (default is two hours).
- Link Loss — The 6820 Bluetooth adapter is able to recover from broken Bluetooth connections, including out-of-range, interference, power failure, or other conditions resulting in a

broken connection. It returns to its previous Discoverable/ Connectable state after a lost connection.

- Master/Slave — Printer participates in a Bluetooth connection as the slave device.

- The Class of Device is 0x040680 which translates to a Service Class of Rendering, a Major Device Class of Imaging, and a Minor Device Class of Printer.

- The 6820 Bluetooth includes an SDP record that allows the printer to report an SPP instance with a service name of Wireless Printer.

- The default Bluetooth device name is 6820-DDEEFF, where DDEEFF matches the respective portion of the Bluetooth device address (AA:BB:CC:DD:EE:FF). If the printer the adapter is connecting to is known, the service name is changed to 6820-SN, where SN is replaced with the serial number of the 6820.

- The 6820 Bluetooth adapter can save 16 link keys across cold boots. Link keys are saved in a circular list. The 17th link key replaces the first, the 18th replaces the 2nd, and so on.

Remote Configuration

You can query the following items remotely:

- Discoverable State [Get/Set]

- Connectable State [Get/Set]

- Bondable State [Get/Set] *(*Authentication)

- Encryption State [Get/Set]

- Device Name [Get/Set]

- Device Address[Get]

- Class of Device[Get/Set]

- Service Name [Get/Set]

- Bluetooth Profile [Get]

- Bluetooth Passkey [Set]

- Radio Shutdown Timeout

Bluetooth Performance

- Range — Operating range is expected to range from a minimum separation of 10 cm up to 10 m with a Bluetooth-enabled mobile computer.

- Link Loss can occur when going in or out of range while communicating with other Bluetooth devices.

- Link Loss can occur if there are metal obstructions between the mobile computer and the printer.

Diagnostic Capabilities

The 6820 Bluetooth adapter sends a printout of Bluetooth information to the printer when it receives a message from a 700 Series or CK61 in a terminal holder. An example self-test is shown below:

```
6820 Bluetooth Adapter
Firmware:                 Version YYYY MMDD HHMM

Bluetooth Configuration:
   Device Address:        0002371A0FD3
   Device Name:           6820-9843252
   Discoverable:          Yes
   Connectable:           Yes
   Authentication:        No
   Encryption:            No
   Passkey:               Not Applicable (or Key present
if Authentication is enabled)
Stored Link Keys:         2 of 16

Power Management:
   Shut Off Timer:        120 minutes
```

The Passkey entry either states Not Applicable or Key Present depending on the Authentication state.

Using the Information Application

A 6820 Bluetooth Information application that prints the Bluetooth self-test information on the 6820 can be installed on your 700 Series or CK61 mobile computer.

To use the Bluetooth Information application

1 Insert the 700 Series or CK61 in the terminal holder on the 6820.

2 Tap the **Start** > **Programs** > the **6820 BT Information** icon on your 700 Series or CK61 computer.

3 Press the **Set Page** button on the printer control panel to wake the printer.

4 From the 6820 Bluetooth Self-Test screen, tap the **Trigger Self Test** button to print the information.
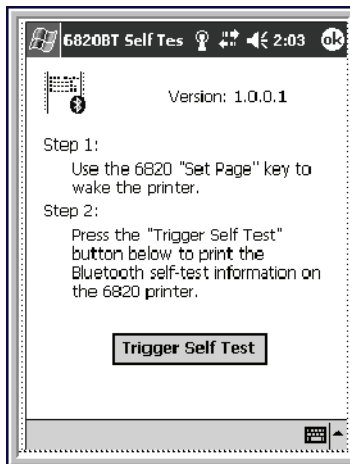
System Qualification

Operation Resilience

Normal operation of the Bluetooth system is available in environments with radio backbones, including 802.11b, Spectrum 24, and OpenAir technologies.

Specifications

Temperature

Operating	-20 °C to 60 °C (-4 °F to 140 °F)
Storage	-30 °C to 70 °C (-22 °F to 158 °F)

Temperature Test Results

Test	Range	Comments
Operating Cold to Hot Transition	-20 °C to 50 °C (-4 °F to 122 °F)	External condensation allowed, internal prohibited
Operating Hot to Cold Transition	50 °C to –20 °C (122 °F to -4 °F)	Speed shall not degrade
Humidity		5% to 95% RH non-condensing
Operating	90%	25 °C to 60 °C (48 °F to 140 °F) no condensation
Storage	90%	25 °C to 60 °C (48 °F to 140 °F) no condensation

Altitude

-100 to 5000 meters

Vibration Test Results

Test	Comments
Quasi-Random 3 axis	12 g RMS, for 4 hours
Dynamic Induced Shock	20 g on 3 axis
Operating	1 G 5 Hz to 80 Hz
Storage	3 G 5 Hz to 80 Hz
When packed	
Frequency	5 to 55 Hz

Vibration Test Results (continued)

Test	Comments
Acceleration	2 G
Sweep	10 minutes (half cycle)
Duration	1 hour
Directions	x, y, and z

No external or internal damage should be found after the vibration test, and the unit should operate normally.

Unpackaged Drop

2 feet to concrete

Terminal Insertions

Minimum of 30,000 insertions for the terminal holder.

Default Bluetooth Configuration Settings

Default Bluetooth Configuration Settings

Setting	Default
Bluetooth Authentication	Off
Discoverable	True
Connectable	True
Class of Device	0x040680
Service Name	Wireless printer
Device Name	6820-DDEEFF
Baud Rate	19,200
Data Bits	8
Stop Bits	1
Parity	None
Handshaking	Hardware
Radio Shutdown Timeout	120 minutes

C
Cross-Reference Tables

A set of cross-reference tables are provided to assist you in locating control codes and escape sequences. The default settings are also included.

Single Character Control Codes

This table contains control codes between 00h and 7Fh, and provides definitions for the ASCII symbols as used in the table on the next page and in format definitions. For more information, see Chapter 4, **"Control Code Definitions."**

Single Character Control Code Definitions

Dec	Hex	ASCII	Description
0	00	NUL	Used as a terminator for several escape sequences
1	01	SOH	
2	02	STX	
3	03	ETX	
4	04	EOT	
5	05	ENQ	
6	06	ACK	
7	07	BEL	Beeper: sounds buzzer for 1/10 of a second
8	08	BS	Backspace: moves printhead one space to left
9	09	HT	Horizontal Tab: moves printhead to next tab stop
10	0A	LF	Line Feed: moves paper to next line
11	0B	VT	Vertical Tab: moves paper to next vertical tab stop
12	0C	FF	Form Feed: advances paper to top of next page
13	0D	CR	Carriage Return: moves printhead to left margin
14	0E	SO	Shift Out: selects double-wide mode (one-line-only)
15	0F	SI	Shift In: selects condensed (compressed) mode
16	10	DLE	
17	11	DC1	Device Control 1: sets printer online (not currently used)
18	12	DC2	Device Control 2: cancels condensed mode (compressed)
19	13	DC3	Device Control 3: sets printer offline (not currently used)
20	14	DC4	Device Control 4: cancels double-wide mode (one line only)
21	15	NAK	
22	16	SYN	
23	17	ETB	
24	18	CAN	Cancel Line: clears all characters out of print buffer

Single Character Control Code Definitions (continued)

Dec	Hex	ASCII	Description
25	19	EM	
26	1A	SUB	
27	1B	ESC	Escape: defines start of escape sequence
28	1C	FS	
29	1D	GS	
30	1E	RS	
31	1F	US	
32	20	SP	Space character
127	7F	DEL	Delete: deletes last character in print buffer

Escape Sequence Quick Reference

The following table is a quick reference between the escape sequences listed in ascending order, according to numeric values. For more information, see Chapter 4, **"Control Code Definitions."**

Escape Sequence Cross Reference

Decimal	Description
ESC SO	Select double-wide (expanded) mode (one line only)
ESC SI	Select condensed mode (compressed)
ESC US (0)	Select top-down printing
ESC US (1)	Select bottom-up printing
ESC SP n	Define inter-character space
ESC "!" n	Master select
ESC "$" n1 n2	Set print position (absolute)
ESC "%" (0)	Select default character set
ESC "%" (1)	Select user-defined character set
ESC "&" NUL k1 k2 s1 d1...d11	Define user-defined characters
ESC "*" m n1 n2	Select graphics mode
ESC "+" n d1...dn	Print character graphics
ESC "-" 0*	Cancel underline mode
ESC "-" 1*	Select underline mode

Escape Sequence Cross Reference (continued)

Decimal	Description
ESC "/" c	Select vertical tab channel
ESC "0"	Select 1/8 inch line spacing
ESC "1"	Select 7/72 inch line spacing
ESC "2"	Select 1/6 inch line spacing
ESC "3" n	Select n/216 inch line spacing
ESC "4"	Select italic mode
ESC "5"	Cancel italic mode
ESC "6"	Enable printing of codes 128-255
ESC "7"	Disable printing of codes 128-255
ESC "<"	Select unidirectional printing (one line only)
ESC ":" NUL NUL NUL	Copy ROM to RAM
ESC "?" s n	Reassign graphics mode
ESC "@"	Perform master reset
ESC "A" n	Select n/72 inch line spacing
ESC "B" NUL	Clear vertical tabs
ESC "B" n1 n2 ... nk NUL	Set vertical tabs
ESC "C" n	Set page length (lines)
ESC "C" NUL n	Set page length (inches)
ESC "D" NUL	Clear horizontal tabs
ESC "D" n1 n2 ... nk NUL	Set horizontal tabs
ESC "E"	Select emphasized mode
ESC "F"	Cancel emphasized mode
ESC "G"	Select double-strike mode
ESC "H"	Cancel double-strike mode
ESC "I" n	Expand printable code area
ESC "J" n	Perform n/216 inch line feed
ESC "K" n1 n2	Select single-density graphics mode
ESC "L" n1 n2	Select low-speed double-density graphics mode
ESC "M"	Select elite pitch
ESC "N" n	Set skip over perforation
ESC "O"	Cancel skip over perforation
ESC "P"	Select pica pitch

Escape Sequence Cross Reference (continued)

Decimal	Description
ESC "Q" n	Set right margin
ESC "R" n0 n1 n2	Code page selection
ESC "R" n	Select national character set
ESC "S" 0*	Select superscript mode
ESC "S" 1*	Select subscript mode
ESC "T"	Cancel superscript/subscript mode
ESC "U" 0*	Cancel unidirectional printing
ESC "U" 1*	Select unidirectional printing
ESC "W" 0*	Cancel double-wide (expanded) mode
ESC "W" 1*	Select double-wide (expanded) mode
ESC "Y" n1 n2	Select high-speed double-density graphics mode
ESC "Z" n1 n2	Select low-speed quadruple-density graphics mode
ESC "^" (0) n1 n2	Select 9-pin single density graphics mode
ESC "^" (1) n1 n2	Select 9-pin double density graphics mode
ESC "b" c NUL	Clear vertical tab channel
ESC "b" c n1 n2 ... nk NUL	Set vertical tabs in channel
ESC "j" n	Perform n/216 inch reverse line feed
ESC "l" n	Set left margin
ESC "s" 0*	Cancel half-speed printing
ESC "s" 1*	Select half-speed printing
ESC "t" (0)	Disable printing of character graphics
ESC "t" (1)	Enable printing of character graphics
ESC "z" n	Set inactivity time for sleep mode
ESC "\" n1 n2	Set print position (relative)

D
Printer Font Test Jobs

This appendix contains a sample print job for each font available on your 6820 printer.

About the Printer Font Jobs

You can perform these tests yourselves. Load the font of choice from the Toolkit CD into flash memory. After downloading the desired font, use any of the sample print jobs to reveal the character locations within the printer memory. The sample test print jobs are formatted as a memory mapped and can be referenced to select a specific character.

You do not need more than one font module loaded. Any one of: nft00932.mod, nft00936.mod, nft00949.mod, or even nft00950.mod Asian fonts can be used. These are distributed on the 6820 toolkit CD (including the source code).

These print jobs are in this appendix:

- "BIG5.C" which creates "BIG5950.TXT"
- "CHINA.C" which creates "GB2312.TXT"
- "IBM437.C" which creates "IBM437.TXT"
- "JAPAN.C" which creates "JIS932.TXT"
- "KOREA.C" which creates "KOREA.TXT"
- "NATION.C" which creates "NATION.TXT"

Big 5 Traditional Chinese Character Set

This program generates a text file, big5950.txt, to copy to a 6820. The text file illustrates the use of the BIG 5 traditional Chinese character set. Install the BIG 5 character font (nft00950.mod) using the Printer Configuration Utility.

To print big5950.txt correctly

1 Use the Microsoft C version 7.00 compiler.

   ```
   cl big5.c /link slibce graphics
   ```

2 Run big5.exe to create big5950.txt.

3 Copy this text file to the appropriate printer port.

Simplified Chinese Character Set

This program generates a text file, gb2312.txt, that you can copy to a 6820 printer. The text file illustrates the use of the Simplified Chinese character set. Install the Simplified Chinese character font (nft00936.mod) using the Printer Configuration Utility.

To print gb2312.txt correctly

1 Use the Microsoft C version 7.00 compiler.

```
cl china.c /link slibce graphics
```

2 Run china.exe to create gb2312.txt.

3 Copy this text file to the appropriate printer port.

IBM 437 Code Page Character Set

This program generates a text file, ibm437.txt, to copy to a 6820. The text file illustrates the use of the IBM 437 code page character set. Install the IBM 437 character font (nft00437.mod) using the Printer Configuration Utility.

To print ibm437.txt correctly

1 Use the Microsoft C version 7.00 compiler.

```
cl ibm437.c /link slibce graphics
```

2 Run ibm437.exe to create ibm437.txt.

3 Copy this text file to the appropriate printer port.

Japanese (JIS) Character Set

This program generates a text file, jis932.txt, to copy to a 6820. The text file illustrates the use of the JIS character set. Install the JIS character font (nft00932.mod) using the Printer Configuration Utility.

To print jis932.txt correctly

1 Use the Microsoft C version 7.00 compiler.

```
cl japan.c /link slibce graphics
```

2 Run japan.exe to create jis932.txt.

3 Copy this text file to the appropriate printer port.

Korean Character Set

This program generates a text file, korea.txt, to copy to a 6820. The text file illustrates the use of the KSC5601 character set. Install the KSC5601 character font (nft00949.mod) using the Printer Configuration Utility.

To print korea.txt correctly

1 Use the Microsoft C version 7.00 compiler.

```
cl korea.c /link slibce graphics
```

2 Run korea.exe to create korea.txt.

3 Copy this text file to the appropriate printer port.

International Character Set

This program generates a text file, nation.txt, to copy to a 6820. The text file illustrates the international character sets available for use in the default character set. Install the default character set font (nft00000.mod) using the Printer Configuration Utility.

To print nation.txt correctly

1 Use the Microsoft C version 7.00 compiler.

```
cl nation.c /link slibce graphics
```

2 Run nation.exe to create nation.txt.

3 Copy this text file to the appropriate printer port.

I

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6820 Series 80-Column Printer User Manual

P/N 935-013-003